FIRE ENGINEERING

The Journal of the Fire Protection Profession Since 1877

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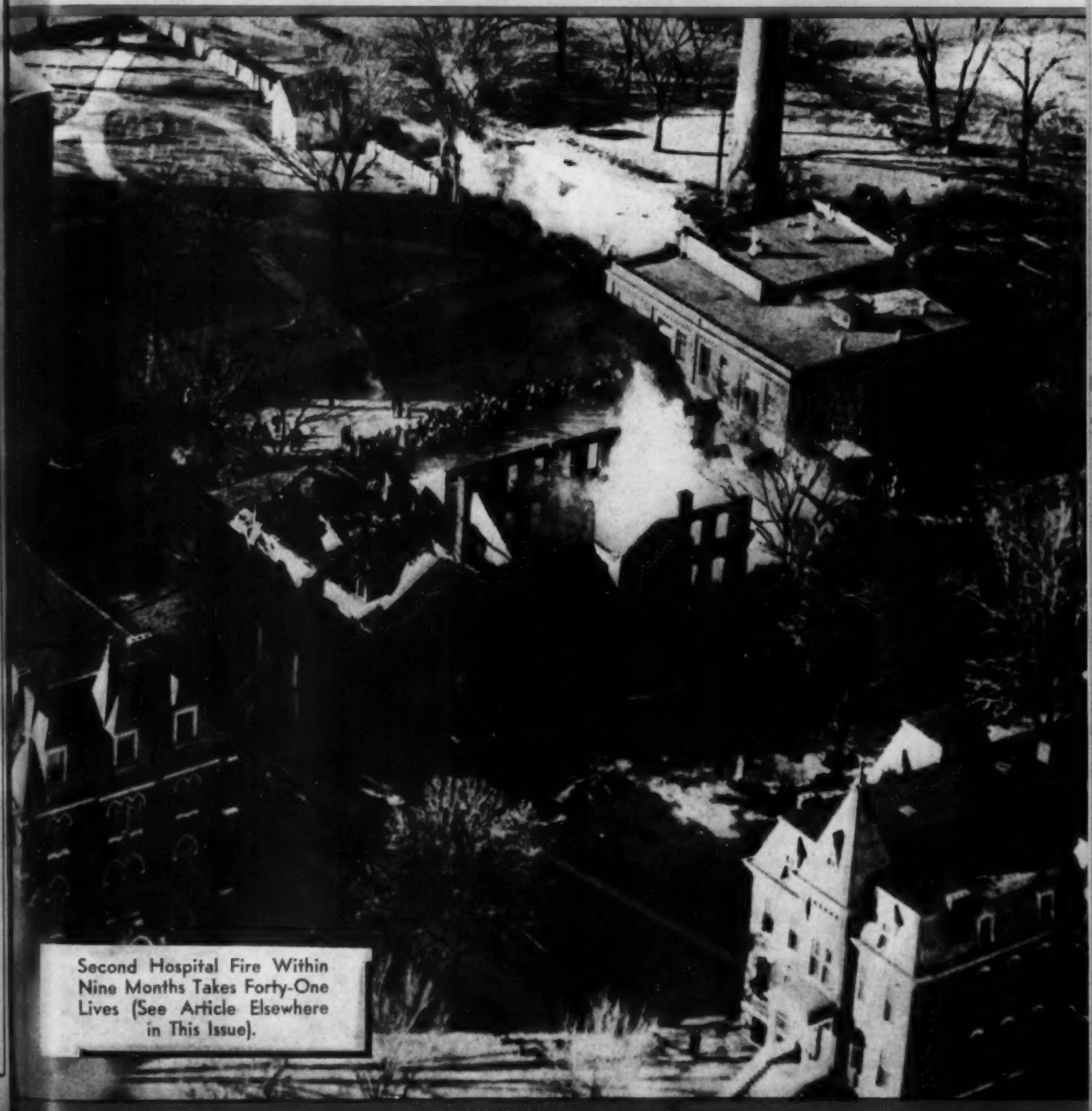
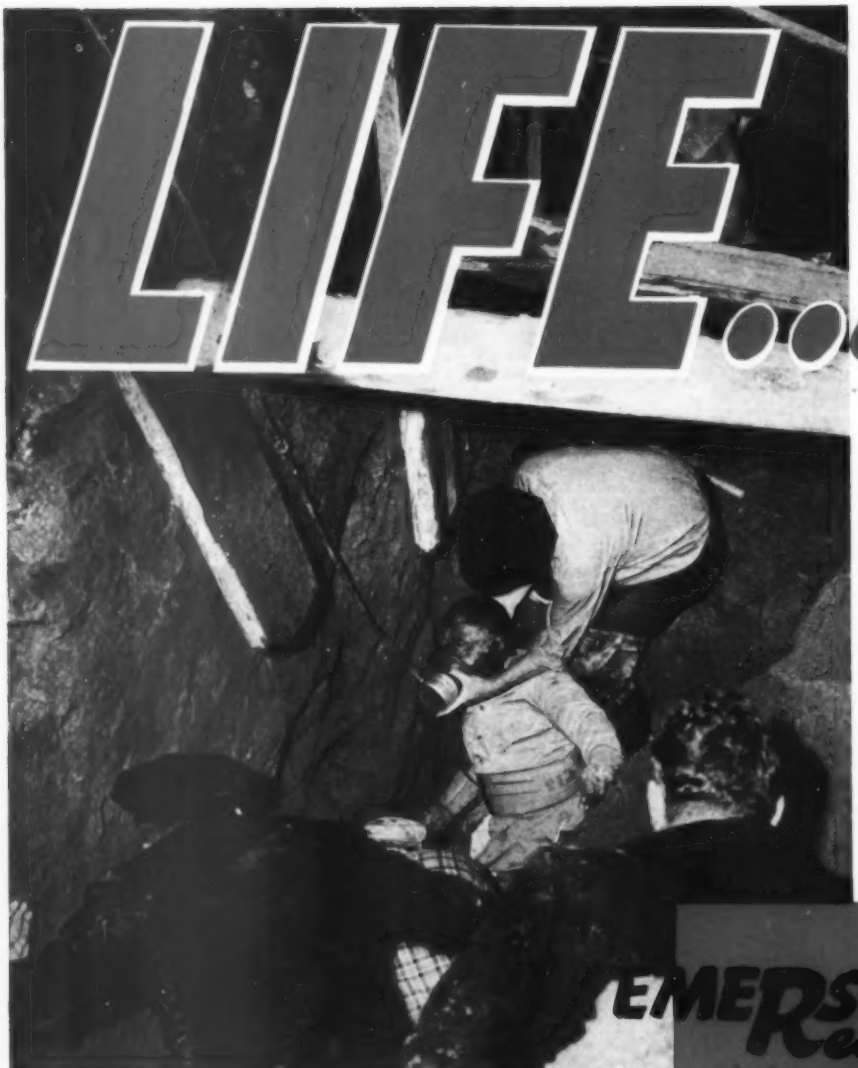


Second Hospital Fire Within Nine Months Takes Forty-One Lives (See Article Elsewhere in This Issue).

A CAFFE-SUERSTEDT-VANN PUBLICATION

LIFE... Saved by the life line from "old faithful"



EMERSON Resuscitator

From hundreds of feet away an EMERSON can breathe life into a stricken person's lungs. If the victim is injured, trapped under debris, or in an inaccessible place, you can still bring him the breath of life if you reach his face with one hand holding the *EMERSON* mechanism.

Sections of extension hose can be joined instantaneously, as needed. A length of over 400 feet has been tested to run a cluster of 5 mechanisms at its far end.

The photograph above shows an actual rescue, as reported in the *Philadelphia Inquirer*.

J. H. EMERSON CO.
22 Cottage Park Avenue, Cambridge 40, Massachusetts

"Simplest and Safest"

Year 'round . . . all-around

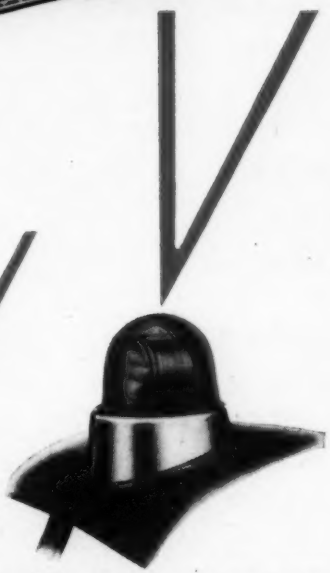
FEDERAL *Vital* PROTECTION

BOYER FIRE APPARATUS CO.

Every minute, the year-round, your Federal Siren is ready to pierce high level traffic noises with its authoritative roar and provide instant protection vital to safety.

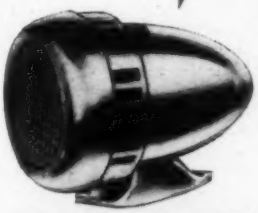
Your Beacon Ray Light visibly matches the audible warning by projecting its intense beams rotating thru 360°. Running or parking you alert traffic in every direction front, sides and rear—the ultimate in all-around protection.

Write today for full details on latest Federal Sirens and Warning Lights.



FEDERAL BEACON-RAY LIGHT

SPECIFY A C5G SIREN AND #17 BEACON RAY LIGHT ON YOUR NEW APPARATUS.



FEDERAL C5G SIREN

FEDERAL ENTERPRISES, INC.

FORMERLY: FEDERAL ELECTRIC COMPANY, INC.

8702 SO. STATE STREET • CHICAGO 19, ILLINOIS

FIRE ENGINEERING

A Consolidation of FIRE AND WATER ENGINEERING, THE FIRE ENGINEER, FIRE PROTECTION *and* FIRE SERVICE

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FRED SHEPPERD
Editor

ROI B. WOOLLEY
Assistant Editor

We Fill a Void!

THE other day we got a surprise. We found there was *one* big South American fire department that wasn't on the subscription list of FIRE ENGINEERING!

● We learned it when three fire officers of that certain department dropped in at our office and left orders for over $100 worth of C-S-M handbooks and several subscriptions for "FE". In doing so they complained plaintively that they had never received this Journal and needed it, along with our handbooks, in their business.

● Now we've plugged the last gap in setting up our *entente cordiale!*

The same day they arrived, there came also a copy of *Brandschutz*, the progressive German journal devoted to that country's fire service. Looking within we noted with some pardonable gratification, two leading articles from earlier issues of FIRE ENGINEERING had been reprinted in full. One was on the Noronic disaster.

● This evidence of worldwide recognition and readership may mean little to our average American reader, but it is relished by those fire equipment and apparatus companies who pay out their good dollars for good advertising space—a feature of FIRE ENGINEERING that is read with the same absorbing interest as our editorial pages.

The Publishers

FIRE ENGINEERING

The Journal of the Fire Profession since 1877; published on the fifteenth of each month by Case-Shepperd-Mann Publishing Corp., 24 West 40th St., New York 18, N. Y., also publishers of *Water Works Engineering, Sewage and Industrial Wastes Engineering*, etc. ¶Subscription price: U. S., Latin America and Canada, $3.00 a year; Foreign, $4.00; Single copies, 35c. ¶Member of Audit Bureau of Circulations and Associated Business Papers, Inc. ¶Entered as second class matter April 15, 1929, at the Post Office at New York, N. Y., under Act of March 3, 1879. ¶Contents of this issue copyrighted, 1950, by Case-Shepperd-Mann Publishing Corp. President and Advertising Director, KARL M. MANN; Vice-President and General Manager, I. HERBERT CASE; Secretary and Editorial Director, FRED SHEPPERD; Assistant Advertising Director, WALTER H. FREDRICKS; Eastern Representative, ALFRED J. HOUGHTON; Advertising Manager, WILLIAM J. GIBSON; Circulation Manager, W. H. TOPHAM. CHICAGO OFFICE: W. S. CLEVENGER and L. M. ROCHE, 8 So. Dearborn St., Chicago 3, Ill.; SAN FRANCISCO: CHARLES H. WOOLLEY, 605 Market Street, San Francisco 5, Calif.; LOS ANGELES: AUGUST HAURIN, 6000 Miramonte Blvd., Los Angeles 1, Calif. ¶Printed in U.S.A. U. S. A.

A CASE-SHEPPERD-MANN PUBLICATION
"Specialized Leadership"

Here's how MACK helps you get... new apparatus

• Yes, Mack is telling public-spirited citizens in your own community of your continued need for new apparatus – showing them how they can thus help strengthen their fire protection. Powerful advertising messages like this two-page spread will appear throughout the year in such leading national magazines as *Saturday Evening Post, Fortune, Time, Newsweek* and *Business Week* – another evidence of Mack's continued cooperation in working for the betterment of the nation's fire service.

Reprints of these advertisements are available to help in your campaign to replace obsolete or inferior equipment. Just let us know how many you require, or see your Mack representative.

Everybody loves a Fire Engine, but...
it's what it can do that counts!
Mack
M.F.D.
1
How you can help secure needed fire apparatus for your town
Special note to Fire Chiefs
Modernize with Mack outlasts them all!
modernize with
Mack
...outlasts them all!
This colorful double-page advertisement calls public attention to the need for systematic programs of fire apparatus replacement. Look for it and others in leading magazines, or get your free copies – as many as you need.
Mack Manufacturing Corp.
FIRE APPARATUS DIVISION • Long Island City 1, N. Y.
Factory branches and distributors for service and parts in all principal cities. In Canada: Mack Trucks of Canada, Ltd.

ROCKWOOD AUTOMATIC PROPORTIONER

for FOAM Liquid and Wetting Agent

Built into New Mack Pumper for West Springfield, Mass.

Fire Chief Frederick Sibley standing alongside his new triple combination 750 g.p.m. pumper built by the Mack Manufacturing Corp.

FOAM liquid and Wetting agent are automatically proportioned into fire hose lines by the latest type Rockwood Automatic Proportioning equipment built into the new triple combination Mack 750 gallon pumper recently delivered to the West Springfield, Mass. fire department.

This new proportioning equipment was specified by Fire Chief Frederick Sibley because it makes it possible to apply FOAM or Wetting agent to a fire with far greater speed and less work than with old style methods. It will also save the cost of the proportioning equipment thru the more economical use of FOAM Liquid and Wetting agent.

Chief Sibley also included the new Rockwood Type FFF FogFOAM Nozzles, Rockwood Type SG-48 WaterFOG Nozzles with extension applicators, Rockwood FOAM Liquid and Rockwood Wet in specifications for his new truck. This provides the West Springfield department with the most modern proportioning equipment and appliances for applying FOAM, Wetting agent and water to fires.

Both Rockwood FOAM Liquid and Rockwood Wet were designed to give you the most efficient results in fire fighting and to protect your apparatus from damage. Specify these latest Rockwood products when ordering your new fire truck.

FogFOAM being discharged from 1½" Type FFF Nozzle at West Springfield, Mass.

Solid FOAM stream discharge from 1½" Type FFF Rockwood Nozzle. Same Nozzle will also discharge high velocity WaterFOG.

ROCKWOOD

ROCKWOOD SPRINKLER CO.

54 HARLOW ST. WORCESTER 5, MASS.

Specialists in Fire Prevention Engineering Equipment and Installation since 1907

How a cord ply 12" long adds 100% more strength to hose

B. F. Goodrich end protection stops blowouts, adds years of hose life

WHERE coupling and hose meet—that's the danger area in fire hose. That's where, in ordinary hose, cracks and blowouts occur, due to pressure, flexing, strain. But in B. F. Goodrich fire hose, this cause of hose failure is eliminated. Here's how—

"End protection", a patented B. F. Goodrich improvement, is an added ply of hard woven cords that extends back 12" from the coupling. Because of end protection, not one single length of B. F. Goodrich fire hose has ever failed in the coupling area.

Not damaged by connections, pressure—Coupling and uncoupling to hydrant or truck sometimes twist or strain hose. Pulsations from water pressure flex the hose. But with B. F. Goodrich hose, the reinforced end prevents damage, isn't weakened by these actions. End protection adds 100% more strength to coupling area; costs you not one single penny extra.

Not weakened by coupling—Applying a coupling can sometimes cut or weaken ordinary hose. The "bite" of the expansion can cause hose threads to tear away from coupling. B. F. Goodrich end protection gives an extra cushion of cord to take the thrust of ring against tube. Helps make a tighter coupling, too.

Prevents damage caused by coiling—Rolling hose around the coupling causes kinks—the coupling presses against the kinked part of the hose. Ordinary hose can't take this treatment, gives way under strain. B. F. Goodrich hose with end protection—a reinforced tube near the coupling—is undamaged by coiling, rolling, kinking.

A new BFG Municipal Fire Hose Catalog Section is yours for the asking from your B. F. Goodrich fire hose distributor, or write *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

B.F.Goodrich
RUBBER FOR INDUSTRY

What a Good Looking Fire Engine!

They ALL are, when NEW. But, after 5 years . . . will the finish look dull, color fading, paint peeling, and excessive chipping with rust showing? Not if it is built by American LaFrance. Fourteen process operations are required to meet American LaFrance standards of quality.

THERE IS EXTRA VALUE IN AMERICAN-LAFRANCE FIRE APPARATUS

All bare metal thoroughly cleaned with solvent, steam and compressed air.

First primer and sealer coat applied over all surfaces.

Second primer coat is applied for added coverage and body.

Third coat of primer and sealer gives proper foundation for color.

Water sanded by hand and machine to a perfect base for color coats.

First color coat is applied. Red is shown, other colors when specified.

The second color coat is applied in the series to build up the body.

The third color coat begins to show final color.

The fourth color coat is all some fire departments specify.

The fifth color coat adds depth and body for longer finish life.

The sixth color coat gives added body. No fading with toludine dye.

Wet gas sand by hand with No. 360 for final color coat.

Final color coat for maximum durability in fire service.

Final polish for the gloss and depth of color that has no equal for quality.

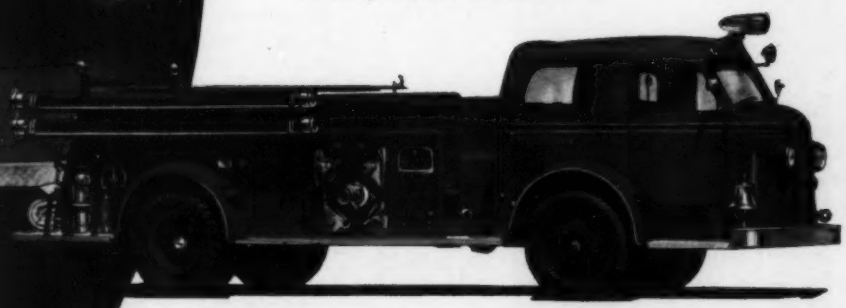
14 different operations and 10 coats of paint provide these extra values

1 **DURABILITY**—The Extra base coats provide a bond between the metal and color coats that assures permanence and freedom from chipping or peeling. All bodies, cabs, water tanks, fenders, side steps, and aprons are fully primed before assembly.

2 **NO FADING**—A maximum of color permanence is provided with toludine dyes. No mineral color pigment to oxidize and fade. After years of service you can still match ALFCO colors. No better paint at any price.

3 **NO DIRT**—Or dust in the standard finish of American LaFrance fire apparatus. Many coats of medium thickness, fast drying under controlled application, eliminate potential causes of paint failure.

4 **EASE OF REPAIR**—Accidents may happen to cut or scrape a finished surface that will require repair. American LaFrance finish permits repair without stripping or removal of finish from an entire panel or fender.



The METROPOLITAN, 1250 g.p.m. pumper.

First in a series of advertisements featuring the EXTRA VALUES in American LaFrance fire engines.

AMERICAN-LAFRANCE-FOAMITE CORPORATION

ELMIRA, NEW YORK, U. S. A.

LAFRANCE FIRE ENGINE AND FOAMITE LIMITED

TORONTO 9, ONTARIO, CANADA

DUO-SAFETY Safety

THREE SECTION

SERIES 525-A

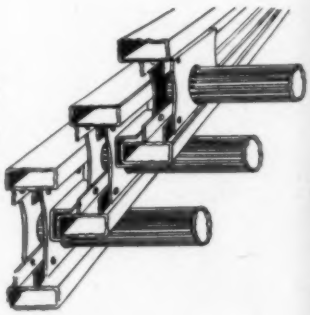
Aluminum Three Sections

The greatest name today in three-section aluminum fire ladders for service trucks is Duo-Safety's Series 525-A. This great ladder, with Duo-Safety's exclusive Tubular Principle, because of its short length in the banked position, eliminates excessive over-hanging of fire ladder equipment. The minimum of banking height is required and the maximum amount of climbing space is provided. And . . . all Duo-Safety aluminum three section ladders . . . both Tubular and Channel Rail design . . . are equipped with one rope hoist . . . both ladder flys will extend simultaneously by pulling one rope. Plus all this . . . the safety, lightness, strength of aluminum, and the many structural advantages found only in Duo-Safety construction make Series 525-A the ladder most fire chiefs demand. Other ladders in this series include: 500-A, Two Section Extension; 550-A, Wall ladder; 575-A, Roof Ladder, and 585-A, Folding Ladder. All are available in a variety of sizes. Write today for free file catalog.

with exclusive

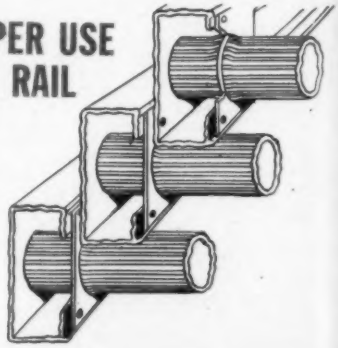
TUBULAR PRINCIPLE

Great strength with light weight, and space-saving design are the important features of Duo-Safety's sensational TUBULAR principle. It's Duo-Safety's answer to REAL Fire Ladder Safety.



SERIES 725A For PUMPER USE CHANNEL RAIL

Here's Duo-Safety's advancement over bulky, old-style, solid side wood pumper ladders . . . the 700 Series with Duo-Safety Channel Rail Construction. Series includes: 700-A, Two-Section Extension; 725-A, Three-Section Extension; 750-A, Wall Ladder; 775-A, Roof Ladder. All are available in a variety of sizes.

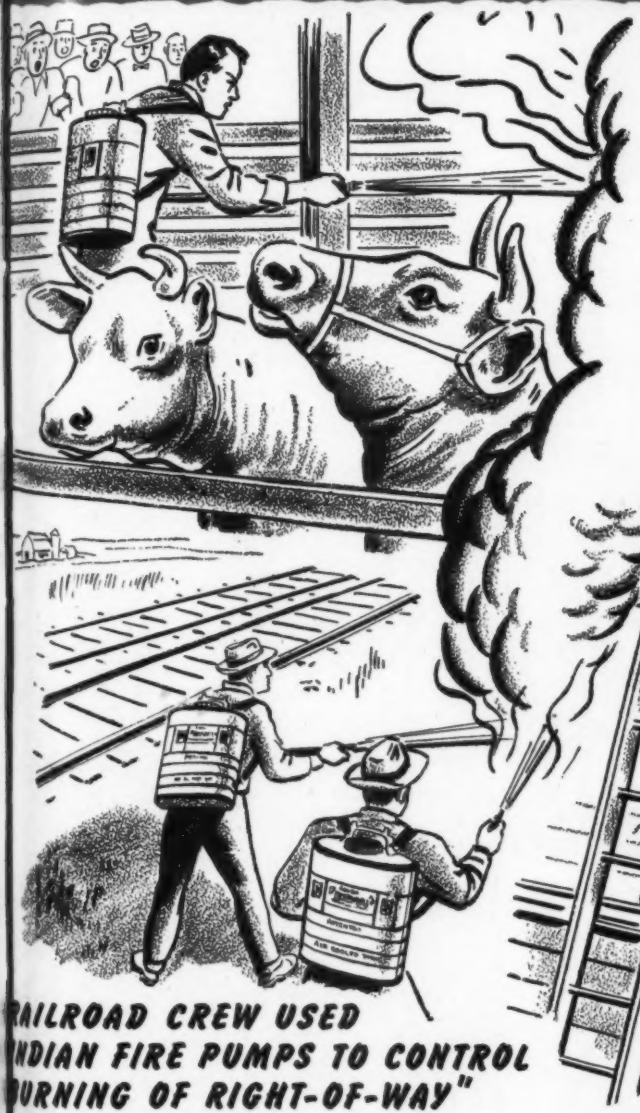


DUO-SAFETY LADDER CORPORATION

811 Ninth Street . . . Oshkosh . . . Wisconsin

Read What Users Say About
INDIAN FIRE PUMPS!

ACTUAL UNSOLICITED TESTIMONIALS TAKEN DIRECTLY FROM OUR FILES



"Indian Fire Pump SAVED BARN AND CATTLE"

*At the County Fair we placed an **INDIAN FIRE PUMP** in one of our livestock barns where there was a great deal of bedding and debris. The second afternoon fire broke out in this barn and if it hadn't been for your pump the barn and a lot of cattle would have been destroyed.*

100,000 people attended the fair and many of them saw the fire and how it was extinguished.

J. M. Savery,
Manager

"USED INDIAN FIRE PUMP TO PUT OUT ROOF FIRE..."

*I received a request from a neighboring town to assist on a farmhouse fire. I sent in an alarm and then took my **INDIAN FIRE PUMP** to the scene in my car.*

*The barn was entirely enveloped in flame and beyond saving. There were 5 spot fires on the roof of the house. I climbed to the roof and put these fires out and kept the roof wet until the pumper arrived. Without question my **INDIAN** saved the house.*

*We consider **INDIANS** a "must" in our department and highly recommend them.*

Fred E. Dwinell,
Chairman Fire District

RAILROAD CREW USED INDIAN FIRE PUMPS TO CONTROL BURNING OF RIGHT-OF-WAY"

*Two weeks ago, during the drouth, on a windy day it appeared the whole pasture country east of here was on fire. Several citizens jumped in their cars and drove in the direction of the fire until they reached the railroad. To their surprise they found the section men were merely burning off the right-of-way and then putting the fire out with **INDIAN FIRE PUMPS.***

*This community needs no convincing as to the value of **INDIANS** and as soon as we had your price list we sold the pumps in advance and mailed you the order.*

McKoy Hardware & Furniture Co.

If you, too, have used INDIAN FIRE PUMPS to advantage why don't you tell us about it? We would like to hear from you.

"DOES A SWELL JOB..."

*Please send your **INDIAN FIRE PUMP** catalog. Our local fire department is equipped with 6 **INDIANS** on one truck and 4 on another. We use them often. The **INDIAN** is easy to operate and does a swell job and has never failed us.*

Arthur L. Kimer,
Secretary, Volunteer Fire Co.

Agents Wanted

FOR DESCRIPTIVE INFORMATION ON THESE FAMOUS FIRE EXTINGUISHERS WRITE TO

D. B. SMITH & CO. UTICA 2, N. Y.

PACIFIC COAST BRANCHES:
Barcalo Equipment & Rubber Co., Inc., 435 Brannan Street, San Francisco 7, California
Bay G. Davis Company, 617 East Third Street
Fred E. Barnett Company, 2806 S. E. 8th Ave., Portland, Oregon
Fred E. Barnett Company, 666 Spring Street
Tilton Glass Sales, Inc., 2700 Fourth Avenue South, Seattle, Washington
L. M. Curtis & Sons, 426 West Third Street South

CANADIAN AGENTS:
Finch Bros. Limited, 110 Alexander Street, Vancouver, B. C., Canada
Duke Equipment Company, Limited, 297 Duke Street

The Hartebeest is Quick...

This African antelope depends on its speed to elude its enemies; can sprint at better than a mile a minute. The hartebeest easily outdistances even the greyhound.

BUT...

Nothing is Quicker than GENERAL QUICK AID FIRE GUARD For Fighting Fire!

When fire strikes, every second counts. The speed of your fire extinguisher may mean the difference between a small blaze and a huge loss in life and property. The exclusive patented Safety Phlare and Panic Proof handle found only on Quick Aid Extinguishers enable you to fight fire fast and fight it effectively. Quick Aid Vaporizing Liquid Extinguisher (shown at right) is widely recognized as America's great utility fire extinguisher, and is Underwriters' Approved for office, factory, home, store, farm, car, truck, boat, or plane. Recommended for gasoline, oil, paint, electrical, and similar fires. Available in 1 and 1½ qt. sizes. Look in the classified section of your telephone book for the Quick Aid trade mark, or write direct for the name of your nearest dealer.

THE GENERAL DETROIT CORP.
DETROIT 7, MICHIGAN
NEW YORK • ATLANTA • CHICAGO • DALLAS
Subsidiaries:
THE GENERAL PACIFIC CORP.
LOS ANGELES • SAN FRANCISCO • SEATTLE
THE GENERAL DETROIT CORP., CANADA, LTD.
WINDSOR • MONTREAL • TORONTO • WINNIPEG

ONLY *Smithco*

gives you a 2000 GALLON FIREFIGHTER

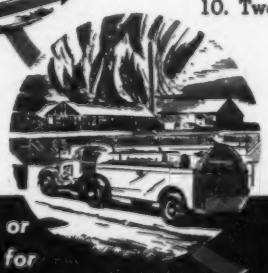
the NEW *Smithco* FIREFIGHTER

. . . designed especially for suburban and rural communities with limited water supply

The new Smithco Firefighter delivers the goods. No rural or suburban community can afford to be without it. Only Smithco gives you a 2000 gallon carrier plus all these extra features.

1. Hale Type FZZ Pump—60 to 150 G. P. M. @ 90 to 30# Pressure
2. 1500 Watt 110 Volt A. C. Light Plant
3. Three 250 Watt Floodlights, Cable, Adapters, etc.
4. Two 12′ Aluminum Pike Poles
5. One 10′ Aluminum Folding Ladder
6. Two 10′ Sections of 2″ Suction Hose with Quick Detachable Couplings
7. Three hundred feet of 1½″ Underwriters "DJ" Hose
8. Two hundred and fifty feet of ¾″ Booster Hose
9. One ¾″ Mystery Fog Nozzle
10. Two 1½″ Mystery Fog Nozzles
11. One 1½″ Siamese Connection
12. One 24′ Aluminum Extension Ladder
13. Four Rubber Rainsuits and Hats
14. Two 15-pound CO_2 Extinguishers
15. One Pioneer Rack with Axe, Pick and Shovel
16. Two 5-Gallon Fuel Cans

RECOMMENDED TRACTOR—F7 or F8 Ford, WC-20T White or Equal



Phone, wire or write today for further information!

L. B. SMITH, Inc.

CAMP HILL, PA., SYRACUSE, N. Y., PHILADELPHIA, PA.

too late

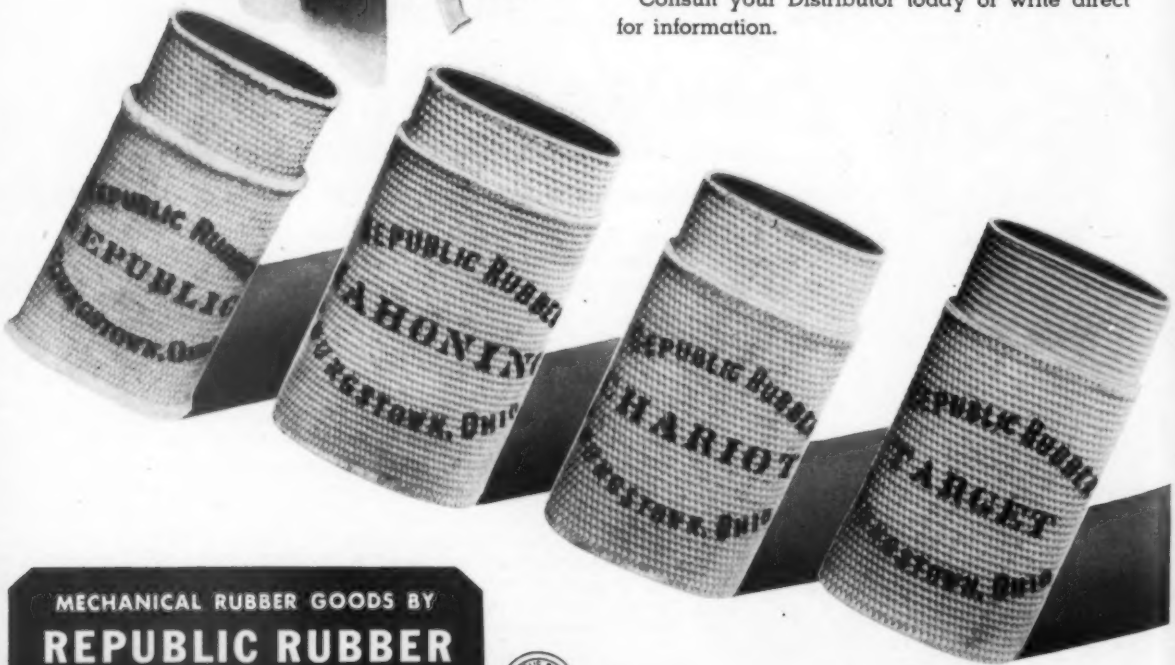
for details now...

Your community is depending on your preparedness, so don't wait too long before selecting Republic Fire Hose.

Republic Fire Hose is always ready for action, because it's made of flaw-proof materials specially treated to resist deterioration. Republic Fire Hose is built with a wide margin of safety to handle extra service requirements.

Special Provar process keeps the hose like new despite long storage periods, and the most advanced principles of design give Republic Fire Hose maximum fire-fighting strength and service ability.

Consult your Distributor today or write direct for information.



MECHANICAL RUBBER GOODS BY
REPUBLIC RUBBER DIVISION

Pioneers in the use of COLD RUBBER

REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION · YOUNGSTOWN, OHIO
Lee Deluxe Tires & Tubes · · · Conshohocken, Pa.

Fifth John Bean High-Pressure Unit purchased for the Lansing, Michigan, Fire Department. This 145-horsepower unit carries its own water supply—provides two guns of 30 gallons each—850 pounds pump pressure. Delivered complete with all accessories.

John BEAN backs up claims with performance!

FOR OVER 60 years John Bean has had a reputation for building superior equipment and backing up every claim with proven performance.

Every time you answer an alarm in a John Bean High-Pressure Fog Fire Fighter, you know you are equipped to handle any emergency. None of the old doubts and worries about inferior equipment!

John Bean High-Pressure Fog Fire Fighters assure maximum protection, minimum fire loss with these outstanding features—

Go into action immediately because they carry their own water supply.

Clear way for close-up work with protective screen of positive-acting High-Pressure Fog.

Put fires out faster because Bean High-Pressure Fog out-absorbs water 10 to 1.

Minimize water damage by extinguishing fires quickly and efficiently.

More than a thousand chiefs swear by John Bean because they know Bean backs up claims with performance. Write today for more information about how you can increase your department's efficiency with this modern fire-fighting equipment.

BEAN *Original* HIGH-PRESSURE FOG FIRE FIGHTER

CAN BE MOUNTED ON MOST STANDARD TRUCK CHASSIS

FOOD MACHINERY AND CHEMICAL CORPORATION

JOHN BEAN DIVISION, DEPT. 126, LANSING 4, MICH. • JOHN BEAN DIVISION (WESTERN), 409 JULIAN ST., SAN JOSE, CALIF.

BUILDERS OF BEAN HIGH-PRESSURE PUMPS FOR OVER 60 YEARS

The Original MIDWESTERN Yellow Striped Safety Coat Is Again Available . .

for Men of Action!

Here's Protection and Comfort in Your Hazardous Work of Safeguarding Life and Property Against FIRE!

Modern fire fighting calls for ***specialized*** protective clothing . . . clothing that safeguards the fireman's life on every run . . . clothing that enables him to use his equipment to the fullest advantage.

Every Midwestern product combines the thoughts and suggestions of practical Fire Chiefs and firemen from every section of the country . . . and every purchaser profits from years of Midwestern research and experience. That is why the famous Mackinaw Coat and other Midwestern clothing have embodied in their design every feature necessary for the protection and comfort of firemen.

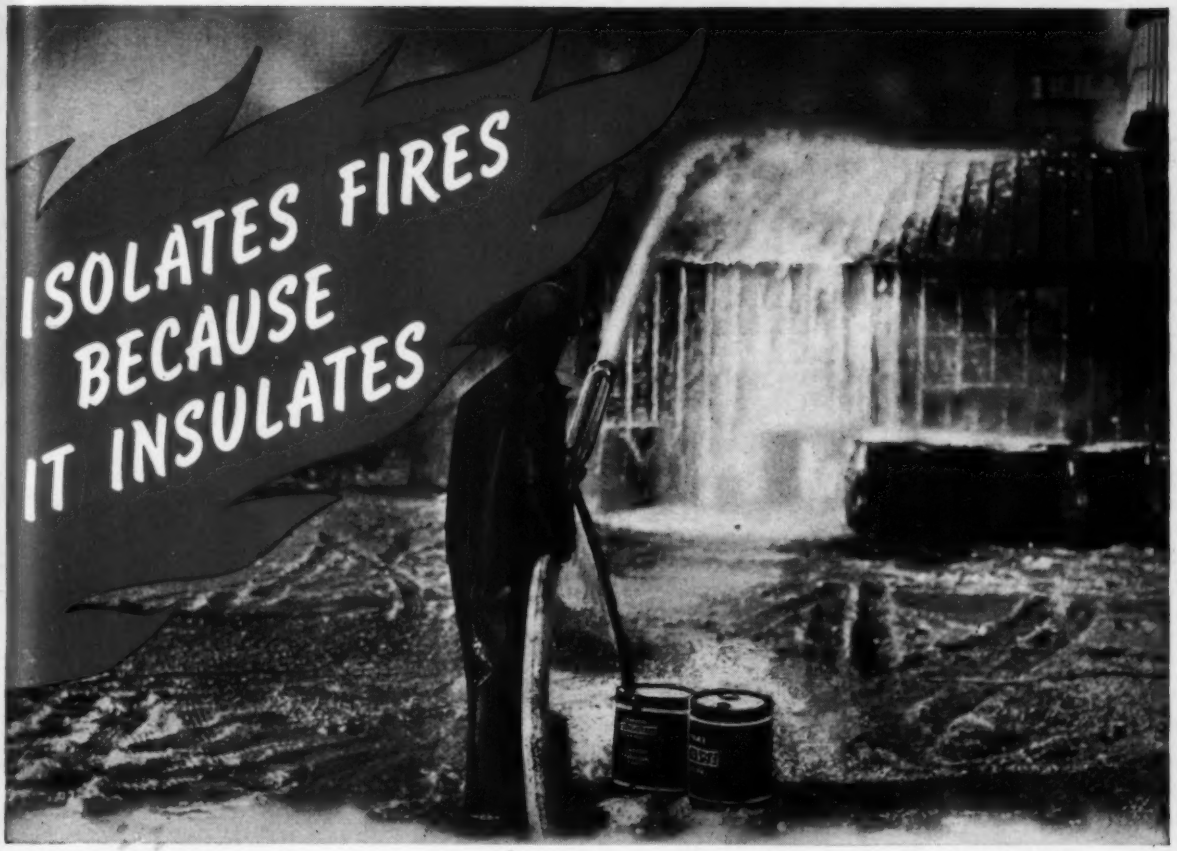
In our vast selection of crude rubber materials you will find a type of fabric suitable for your climate and needs. The softness and flexibility in the high-grade materials used are your assurance of long time service and comfort. Many Fire Chiefs are now including Midwestern clothing in their regular yearly budget and, by placing your order early, you can be assured of this adequate protection when needed.

For complete information, have your Midwestern dealer show you our new garments now manufactured from crude rubber compounds. A letter to the factory will also bring you material samples for your inspection.

We now have available: White, Ivory and Brown crude rubber coats for Chiefs, Assistants and other officers; also all sizes short and ¼ length felt lined Firemen's boots for immediate shipment.

MIDWESTERN MFG. CO., Mackinaw, Illinois

Manufacturers of the Famous **MACKINAW Coats**



INSULATES FROM HEAT AND FLAME · · · SMOTHERS FLAMMABLE LIQUID FIRES

- FLOWS FREELY
- AN AIR TIGHT COATING
- CLINGS TIGHTLY
- LONG LASTING
- POSITIVE PROTECTION
- NON-TOXIC
- NON-CORROSIVE
- NON-CONDUCTING

National AER-O-FOAM makes it possible and very practical to stop the spread of fires and to insulate buildings from heat and flames. With a can of AER-O-FOAM and the AER-O-FOAM NOZZLE, any hose line becomes a bulwark against fire.

Water through the nozzle at hydrant pressure draws AER-O-FOAM from the handy can and mixes it with water, providing a tough, free-flowing, long-lasting blanket of insulation. Easily brushed off when dry. AER-O-FOAM is particularly useful to local and independent fire companies, providing positive-protection economically. It is easy to transport and store, and can be put into action quickly.

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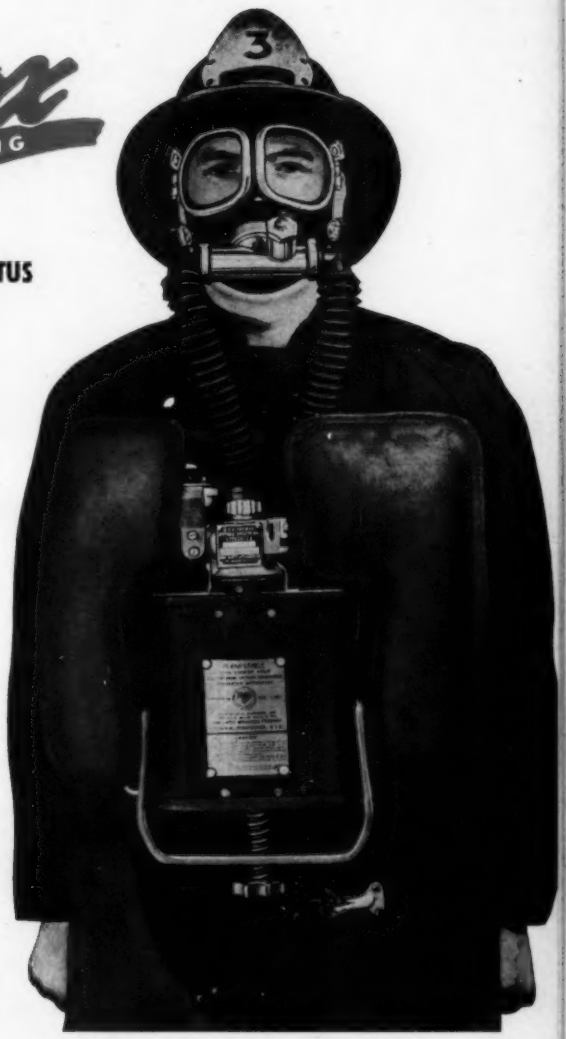

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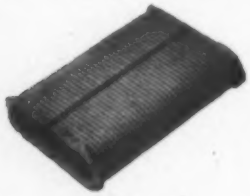

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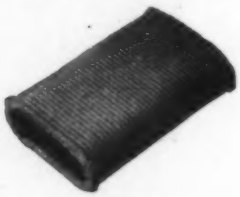

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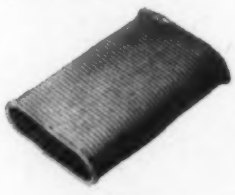

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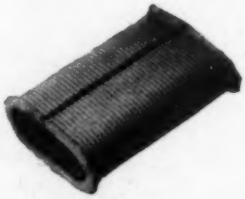

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CITY OF SAPULPA
SAPULPA, OKLAHOMA

J. O. SUMPLIN
CITY MANAGER

W. M. Collier, Fire Chief
Fire Department Headquarters
Sapulpa, Oklahoma
December 12, 1949

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Chief Fire Dept

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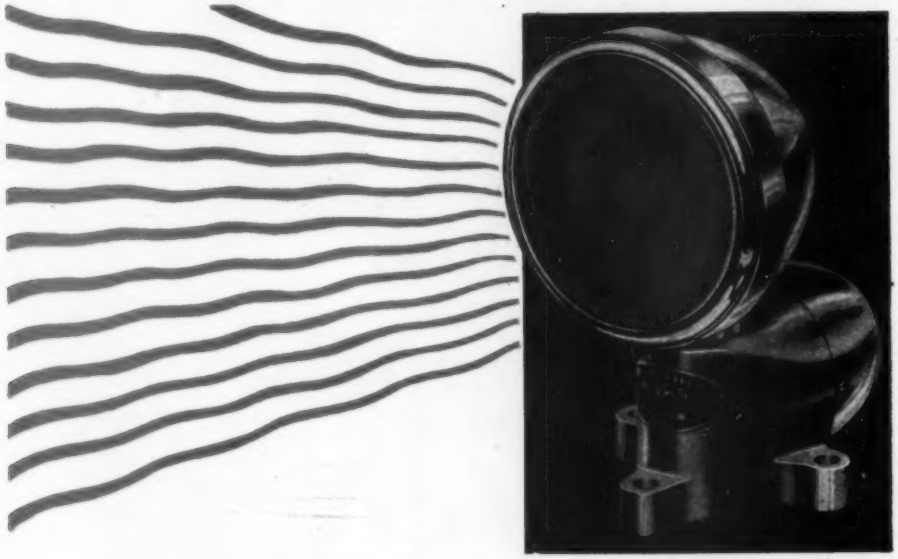

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FIRE ENGINEERING

FEBRUARY, 1950 VOL. 103, NO. 2

With the Editor

Another Hospital Holocaust

On April 4, 1949, fire devastated St. Anthony's Hospital in Effingham, Ill., with a loss of seventy-seven lives.

Nine months later, to a day, fire roared through St. Elizabeth's mental ward of Mercy Hospital in Davenport, Ia., leaving forty-one dead, all of them women, and all but one of them patients, in its wake.

In between these tragedies occurred other fatal fires in hospitals, convalescent homes and institutions. Only the effective operations of the nation's fire services prevented some of these from becoming major disasters.

The St. Elizabeth's Mercy Hospital tragedy came at a time when the country, at least that section of it concerned with reducing our costly fire waste, was pressing for greater safeguards and measures to prevent precisely what happened at Effingham, and later, at Davenport. The latter came just as the National Board of Fire Underwriters was launching its greatest hospital fire hazard hunt in history. It struck as various states and cities were pressing for legislation that would legally outlaw such disasters through insistence upon adequate building safeguards to prevent rapid lateral and vertical spread of fire and installation of proper fire detection, alarm notification and extinguishing systems. It came as fire marshals, hospital authorities and others were overhauling safety facilities and planning new assaults on the fire hazard problem, while magazines and newspapers were running stories about our rundown and hazardous hospitals and mental institutions and radio commentators were voicing their alarms and forebodings.

Notwithstanding all this publicity and hubbub, fire has chalked up another grisly record in the already ghastly history of fires in such occupancies. Only the fact that this latest holocaust occurred in an area protected by a fully paid, well equipped and trained fire department, kept the disaster from reaching far greater proportions.

To the fire control engineer, these two fires offer interesting comparisons.

Both fires occurred in hospitals operated by religious groups. Both involved old, out-worn buildings, which, over a period of time, had received inspections, of sorts, by local and state authorities which had in both cases recommended certain fire protection improvements. In both cases these recommendations had in some way been sidetracked, or overlooked.

Both fires occurred at a time of night when patients were least prepared for them; when the institutions' staffs were at lowest point in numbers and likewise least prepared to discover the fires, notify the fire departments and effectuate evacuation and rescue.

Both fires had a tremendous start, and in addition there is the possibility that both were set. Certainly, discovery was belated in both cases and the fire forces of both cities had two strikes called on them before they ever reached the fire grounds.

In both cases the buildings had been "built to burn"; the alterations and repairs down the years had done little to prevent fire from starting or spreading, or to effect its prompt extinguishment once it had started.

Both institutions lacked automatic fire detection, notification and extinguishing facilities of any type. Neither had automatic sprinkler systems, nor sprinkler alarms, although in both cases these had been recommended for installation. First aid fire fighting equipment was about the same in both cases, the orthodox single jacket hose, on standpipes, so located that its effective use was questionable at any serious fire.

Worse still, in both cases there was apparent lack of any organized plan of procedure of operation for notification of patients and their evacuation in an emergency. The fires caught the staffs (capable and courageous as individuals were) flat-footed. There was resulting lack of comprehension of the seriousness of the emergency and of lack of direction and leadership.

Finally, in both instances, the heads of the state fire marshals offices had only recently been removed from offices which they had long held, by reason of political changes in the two states and the newly appointed incumbents found themselves lacking in both manpower and legal backing to carry on statewide inspections of public institutions and attend to their other duties. In both cases, however, the fire marshals' offices were not unaware of the hazards at these institutions, and others in the same category. In both cases, also, the fire departments were cognizant of conditions and had attempted to eliminate the hazards, with generally poor results largely because they lacked the authority or the legal support to get things done.

The recent St. Elizabeth's mental ward tragedy is the less excusable of the two. With the glaring evidence of the St. Anthony holocaust before the state and hospital officials, nothing concrete appears to have been attempted or accomplished. If we judge by the statements of Fire Chief Lester Schick, quoted in the story of the St. Elizabeth's fire in this issue, little or nothing can be done as long as conditions are as they are in Iowa—a state which, it must be admitted, has been outstanding in other details of fire prevention, firemanship training and fire protection.

Fred Sheppard

Modern Respiratory Equipment Essential in Fire Attack

Is the Fire Service Making Fullest Use of Masks and Breathing Apparatus to Protect Personnel and Speed Rescue and Fire Control?

By ROI B. WOOLLEY

Editor's note—This is the fourth of a series of studies based on modern fire attack strategy. The first, "Coordinated Attack Urged to Improve Fire Control Strategy," appeared in the April, 1949 number of FIRE ENGINEERING. The second: "Adequate Lighting Speeds Up and Safeguards Fire Attack," appeared in the July, 1949 issue. The third, "Carrying the Attack—and the Water, to the Fire," was a feature of the September, 1949 number.

In the first installment, the author advocated a new concept of the problem of fire control and extinguishment—that more emphasis be placed on fire attack and less on defense and that the fire service make fuller and more coordinated use of all the modern facilities to reduce the fire cycle by extinguishing more fires in their incipient stages. Inasmuch as automatic fire detection, alarm and extinguishing systems are not provided for all types of occupancies and all fire risks, the greatest existing opportunity for saving precious time and effort in controlling most fires is in the period between the arrival of the fire forces on the fire ground and their getting into operation to control the fire.

The second installment analyzed the facility of ample illumination of the fire ground and described the latest types of portable light and power plants.

The third installment emphasized the advantages of pre-connected small hose lines supplied from booster tanks and tank pumpers. The increasing use of wet water with fog and fog foam, and the operation of around-the-pump proportioners were described in detail.

In all these factors of attack, using boosters, small lines, fog nozzles with fog and fog foam, wet water, and proper illumination in fire attack, coordination of facilities was urged.

The final, and in the minds of many, the most important factor in fast, safe attack is the adequate use of modern, approved respiratory protective equipment, mask and breathing apparatus. By adequate, the author means (1) sufficient such equipment in every fire department; (2) equipment of a type which provides sufficient respiratory protection for the particular occasion; (3) available or initial response, and (4) personnel trained in its correct operation.

This study attempts to relate this equipment to this newest conception of coordinated fire attack. Lack of space prevents detailed description of all available apparatus and equipment on the market and of the respective advantages of different types and makes. Readers, however, will find the leading manufacturers ready and eager to assist them at all times to make fullest use of this modern fire fighting and rescue essential.

Appreciation is expressed to the many advisors who have assisted the author in the preparation of this study.

IN the year just closed, this nation suffered property fire losses of well over $700 million. Worse still, somewhere near 11,000 persons lost their lives from fire and again as many were seriously injured. Included in the casualty lists were many members of the fire service.

The majority of these fatalities were not from deadly burns, but were the direct result of inhaling the gases of combustion, in many cases super-heated to high temperatures. Call it smoke narcosis, smoke or gas poisoning or plain suffocation, the simple fact is that more people die from these factors than are "burned to death."

In the business of fire control and extinguishment it is safe to say the gases or fumes of combustion, to use the broadest term, are responsible for most of the physical punishment received by fire fighters during extinguishing operations and they constitute the severest handicap to effective fire attack, and, of more importance, to prompt rescue of the victims of fire.

Heat is, of course, also a serious barrier to effective fire attack. But heat, in itself, when not combined with smoke and fumes, does not present as serious a problem to the fire fighter as it does when present with the gases of combustion, particularly those which are toxic in their make-up.

The blaze that roars through the roof, lighting up the night sky, may be more thrilling to spectators but such fires usually present less of an extinguishing problem than the less spectacular, but more deadly, sub-basement fire, the only evidence of which may be choking clouds of smoke, perhaps mixed with fumes of chemicals, and with the danger of deadly back-draft ever present.

Before any fire can successfully be attacked, it must first be located. Likewise, before a person can be rescued from a fire or other emergency involving life, he or she must be found. And the tasks of finding the person and the fire are complicated largely by one thing—the degree and extent to which the premises involved are charged with the gases of combustion, smoke and fumes, and further, the nature of these gases and the presence or absence of life sustaining oxygen in the air.

It is an accepted fact among experienced fire fighters that the size and seriousness of a fire cannot always be gauged by the smoke and gases in evidence. The acrid smudge of a burning rubber tire or of a smoldering mattress may materially delay fire attack. On the other hand a light haze of smoke which invited firemen to attack without masks has been known to knock out an entire company.

To many firemen it remains an unexplained mystery how some minor fires can so completely charge occupancies with what appears to be impenetrable smoke and gases. It is, therefore, scarcely to be wondered why, particularly among non-professional fire fighters (volunteers who do not have ample opportunity to "smell smoke"), such conditions, when experienced, so often slow fire attack with the result that the fire is permitted to extend until, instead of an insignificant blaze that a single booster line might normally quickly

Firemen Equipped with Breathing Apparatus at Work on the Disastrous Fire in the Basement of Covent Garden, London, in December, 1949. One Fireman Was Killed and Several Others Seriously Injured in Fighting the Blaze.

Firemen Wearing Demand Type Breathing Apparatus Operate at a Smoky Drug Store Fire

control, the final outcome is a multiple-alarm job of possible conflagration proportions.

All this was bad enough in the days before windowless buildings, air conditioning, sub-sub-basements, modern decoration with its false fronts, hanging ceilings and concealed spaces; then, at the risk of rapid extension, fire at least had some opportunity to get oxygen for propagation and perhaps vent itself. But today, with modern streamlined construction and stocks and storage of hazardous manufactured and raw materials undreamed of a few years back, the question of attack is more complicated and hazardous than ever.

Under such circumstances the fire fighter's only hope of gaining speedy entry, of locating the heart of the fire, and getting to work on it, with the minimum of risk to himself, is to employ modern respiratory protective equipment. Without this attribute, all the strategy of fast attack, using pre-connected lines, large booster tanks, fog nozzles, applicators, etc., and all the most scientific extinguishing agents, are thwarted. The modern fire fighter may well be on the defensive from the start, without masks and breathing apparatus.

Before discussing these vital aids to rescue and fire control, it is in order to consider briefly some of those elements which make masks so essential: the smoke, gases, fumes and vapors that are present to more or less degree at every fire.[1]

Firemen Encounter Many Different Atmospheric Conditions

We have pointed out that modern civilization has greatly increased the hazards of fire fighting. With our modern types of construction and what we put in our structures in the way of raw materials and manufactured goods the smoke of any fire may well mask death in quick, or lingering form.

To the normal air in any structure involved by fire, contaminants may be added from industrial sources, refrigerants, chemicals, the leakage of manufactured (illuminating and other) gas from pipes or meter connections and from by-products of burning material. The contaminants may come from a relatively small source, for instance a cylinder of gas in a household refrigerator, or a relatively inexhaustible supply, as from a leak of manufactured gas. Little amounts of contaminants may be very poisonous and may cause casualties far out of proportion to their quantity involved in a fire. Sometimes, even the fireman's friend, the hand extinguisher, may turn on him. Carbon tetrachloride and methyl bromide [under certain conditions] may produce toxic gases.

The most important hazards which the fireman must consider in this connection are smoke, complicated at times by products of incomplete combustion, particularly carbon monoxide, and illuminating gas.

When materials are burned, oxygen combines with the carbon in the materials and if combustion is complete, carbon dioxide is the result. However, sometimes portions of the carbon are carried away from the fire by the currents of heated gases before they have been burned. As a result there are particles of soot and tar given off, and various distillation products formed, that have an extremely irritating effect on the nose and eyes.

These are generally non-poisonous. Some firemen are able to stand far more smoke than others. Ordinarily, however, the immediate effect on throat, eyes and lungs is such that it prevents the fireman from performing effective work, and may in extreme cases so interfere with his breathing as to produce unconsciousness.

The other element of smoke, aside from the irritating factors, but by far the most dangerous, is a colorless, odorless gas, carbon monoxide. It is present wherever there is incomplete combustion, and its amount varies according to the intensity of the fire, amount of ventilation and the type of material burned. In a cellar fire, an unventilated attic, or even in closed rooms, the percentage of carbon monoxide may be very high.

Breathing air containing two parts per hundred (2%) of carbon monoxide will cause unconsciousness and death practically as quickly as will drowning. Firemen should regard as dangerous those atmospheres containing as low as one-tenth of one per cent carbon monoxide, especially if they are in it for more than ten minutes (without proper respiratory protective equipment).

In any case where the presence of carbon monoxide in quantity has reason to be suspected, particularly in cellar fires, in gas-filled rooms, or in trenches over a leaking gas main, self-contained equipment is the safest to use for it assures full respiratory protection no matter what the concentration of the gas.

The late Dr. John Charles Olsen, of Brooklyn Polytechnic Institute, well known authority on toxic and poisonous gases, considered every furnished room a potential fire trap for the fire fighter. "Touch wood furniture with fire," he said, "and you get deadly carbon monoxide, and carbon dioxide. Give the air 2% of carbon monoxide and in four minutes you are a dead duck." The rugs, upholstery, the suit you are

Firemen Adjust Their Breathing Apparatus Prior to Entering a Smoky Fire

[1]For the purposes of this study, "respiratory protective equipment" is the term applied to embrace all types of apparatus that enable a wearer to live and work in an atmosphere containing irrespirable (not fit to be breathed) or poisonous gases, smoke, dust, fumes, vapors, or mists, or an atmosphere partly or wholly depleted of oxygen.

wearing, he warns, releases hydrogen sulphide and hydrocyanic acid in a fire, fumes so deadly that several states use hydrocyanic acid instead of the electric chair for capital punishment.

Pre-war silk draperies give out much the same fumes as wool, plus some ammonia and sulphur dioxide in a good blaze. Books, newspapers, are the same as wood cellulose, according to Dr. Olsen, and just as unpleasant to breathe in a fire.

Theory About Crawling Questioned

The scientist makes a further observation based on his experiments with wood, paper, oil, and other fires worth passing on. Fumes, he states, fall into three classes: heavy gases from distillation that sink to the floor; hot combustion gases that rise quickly to the ceiling, and an intermediate layer which, while not pleasant, is purer than either of the others. On this basis, Dr. Olsen exploded the old theory about crawling if caught in a smoky fire. Keeping close to the floor may be as bad as, or worse than standing erect.

Old time practical fire fighters may not have known the chemical constituents of the smoke they faced, but they learned from bitter experience what to treat with suspicion and what to leave alone. The modern fire fighter not only studies his combustion, and its products, but he uses his senses like the old timers to analyze smoke and gases.

SIGHT: is smoke heavy and dense or thin and transparent? What is its color? Is it static, or is it "boiling," i.e., is there "push" behind it? Does it hang low, or tend to rise? Does the sign on the building give a clue as to what is burning?

SMELL: Except for odorless carbon monoxide, most of the products of combustion have characteristic odors. Burning wood smells differently than burning insulation or rubber tires. However, do not rely solely on your nose as a gas detector.

TASTE: To less degree than the above senses, taste sometimes helps determine what is burning. For example, where a refrigeration system using sulphur dioxide is involved in the fire, this gas can be "tasted" at once. It, of course, is a very pungent gas to smell.

Lack of space prevents cataloging the colors and odors of more common burning materials but, as in the case of ignition points and explosive ranges of certain chemicals, these scientific data are available to the fire service. Care, however, should always be used in accepting too literally all such published information because fires usually involve more than a single material and there may lurk in any smoke toxic or poisonous gases. Also smoke may hide deadly oxygen deficiency and the explosive ingredients waiting to touch off a backdraft. Oxygen deficiency makes imperative the use of self-contained respiratory protective equipment.

Masks for Protection—and Attack

In an address before a convention of the International Association of Fire Chiefs, "Gas Masks for the Fire Service" former Chief Harold J. Burke said: ". . . modern fire departments must go in for the extensive use of respiratory protection. It is economically unsound to have firemen overcome by smoke or chemical fumes at fires, particularly when equipment is available that will insure complete protection. It is the inherent right of firemen to be entitled to live normal lives during off-tour periods. Certainly successive doses of smoke and gas inhalation do not guarantee such normal living. Industrial employes would not be permitted to work in atmospheres in which firemen usually operate unless they were properly protected. Some states, by statute, already require protection for firemen."

According to Chief Burke, "it is the fundamental duty of the fire service to extinguish fires with a minimum loss. This can only be accomplished by equipping men to reach the very heart of a fire safely in the shortest possible time."

Every experienced fire fighter will agree that delay in reaching the seat of the small fire, and of getting to work on it while it is still small, because of smoke and gases, has been a large factor in the extension of fire from minor to major proportions, with resultant loss of lives and property.

Fireman Descends Under Covered Deck of Railroad Trestle

Pneumatic tools were used to cut away the track ballast so that firemen could get at the seat of the fire below the trestle. This photo, made in 1936, shows breathing apparatus then in common use.

A Mid-Western Inspection Bureau is quoted as stating that "only with gas masks, (so-called) can the origin of many fires be located early enough to prevent their spread to conflagration proportions."

The majority of seasoned fire chiefs will agree further that, had proper respiratory protective equipment been available to the first-arriving firemen at many fires that "got away," the prompt attack which would have been possible through ability to penetrate the smoke and gases with lines with such protection would have held the fires to insignificant proportions. Some will go further and agree that even on fires that did spread, losses to property and casualties to firemen, would still have been reduced, had sufficient, suitable such protective equipment been immediately available.

No chief officer relishes the thought of pushing an attack on fire, whether he leads it or not, where the punishment to personnel may be out of all proportions to the size of the fire, or the property risk involved.

Under these conditions there is only one solution: masks and breathing apparatus must be a primary factor in fire attack, and rescue, and not a supplementary or secondary factor. Chief Burke contends that "if the financial outlay is a factor. . .at least three pieces of . . . breathing equipment should be carried on every ladder truck and squad unit. . . . A department is not properly protected unless there are at least sufficient pieces of breathing apparatus to protect 50% of the firemen at any fire."

In the detail of respiratory protective

Photo by Hugh Walker

Thorough Drilling in the Use of Breathing Apparatus Is Essential in Order That Men May Work Quickly and Efficiently When a Smoky Fire Is Encountered

equipment, authorities differ as to the wisdom of placing almost sole reliance on the filter, or canister mask.

Without taking sides in this matter, it is true that filter masks are adequate for many fires, but sound judgment must be used.

Another point is that, backing up the filter type or "first line respiratory equipment" must be the more efficient breathing apparatus. There is very definitely room for both such facilities at this stage of fire control (and of fire department budgets).

What is definitely needed, however, is a more intensive use of both types. Studies by this Journal indicate that even the generally accepted filter type is totally unknown in many departments, and is woefully short in supply in others that boast "they have masks." To this must be added the observation that even where some masks are available, there still exists too much aversion to their fullest use by personnel.

Recently an assistant fire chief nearly lost his life because he was overcome and men were unable to reach him because the only masks owned by the department were back at headquarters on an emergency truck that didn't roll to the fire in question. Only a dwelling fire, but a chief officer lost several weeks' work—services that would have paid for additional breathing apparatus for first due companies and for this chief's own automobile.

How Breathing Equipment Furthers Attack

Specifically, how will breathing equipment properly used, further attack? In three general ways: (1) speed rescue efforts, (2) protect fire fighting personnel and (3) reduce fire losses and minimize water losses.

Such equipment permits better, more complete and faster 'size-up.' It is possible to determine where the fire is, what is burning, how the fire is extending, and on what it is feeding. It provides quicker reports on fire conditions. It makes it possible to gauge the hazard to attacking firemen.

Aids in locating entrances and exits, shaftways, stairways in the fire building. Helps to reach interior fire fighting facilities, sprinkler, gas and light and power shut-offs.

Most important of all, it facilitates locating fire victims, trapped persons and casualties.

Makes for easier, faster ventilation through ability to reach openings and ports.

Enables hose lines and/or fire extinguishers to be advanced more rapidly with less punishment to personnel.

Furthers salvage and overhauling, through ability of men to work in atmosphere that otherwise could not be penetrated.

Enables firemen to hold their position where they would otherwise be forced to retreat. This was evidenced at the recent Miami Herald fire in Miami, Florida, described in this Journal, November 1949. Thus, such equipment is invaluable in fire defense as well as attack.

Provides the only answer to certain types of rescue and fire control operations, such as in ships, tunnels, sewers, excavations and in special occupancies typical of the present era—chemical, gas and electric plants, airplane crashes.

Filter or All-Service Mask

The most common mask in use today is the filter type, frequently known as the "all service" type.[2] Filter type masks for the fire service should measure up to the standards established by the Bureau of Mines.

This mask is a device for filtering toxic gases and smoke, but permitting the passage of oxygen and nitrogen (air) to the wearer. It consists of a face piece with special glass insets for vision; straps for fastening; a flexible tube connecting it with a filter, or canister, from which it takes its name. Valves regulate the inhalation and exhalation of air, and a mechanical device or timer indicates the service time remaining in the canister. Latest type masks have a speaking diaphragm face piece which permits transmission of natural speech, thus permitting it to be used with radio or telephone.

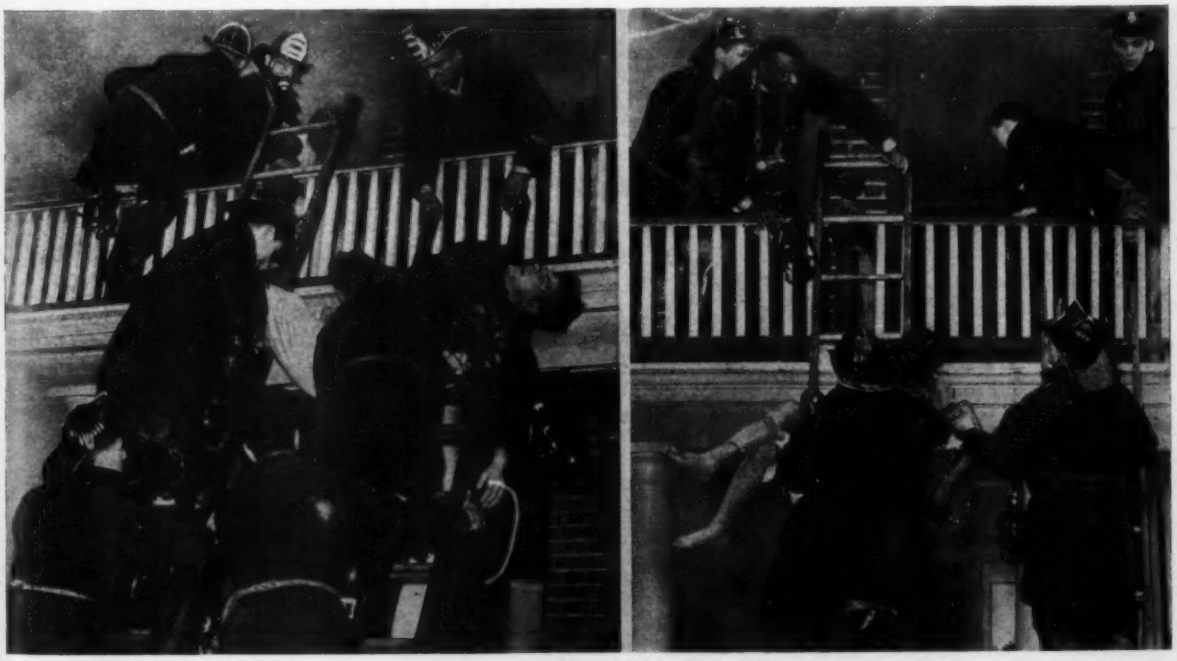
The filter mask cannot be worn where the oxygen content of the air has been so reduced as to be insufficient to sustain human life, i.e., to below 16 per cent. The lower the amount of oxygen, the less work a person can do. Normal air contains 21 per cent oxygen, and the remainder mainly nitrogen which is an inert, harmless gas.

This type mask will protect against all smoke, gases and fumes, including carbon monoxide gas, providing there is sufficient oxygen to support life, and providing the concentration is 2% or less of the poison gas (3% ammonia).

In ordinary fires it is seldom the oxygen content of a structure that is reduced to dangerous levels; it could happen in an unventilated room or building, in a basement, attic or some other confined space. It is particularly to be guarded against in below surface level fires.

When the oxygen content at a fire is reduced to below 15 per cent, smoldering combustion may continue, but most flames will be extinguished. There-

[2]The designation "all-service" and "all-purpose" for this type of mask is somewhat erroneous. As explained above, these masks have certain definite limitations. The filter mask in most general use is the Bureau of Mines Type N.



Even the Dwelling Fire May Present a Severe Smoke Problem

On December 6, 1949, fire involved the home of Mrs. Annie Strong in Washington, D. C. Her rescue was accomplished by firemen wearing canister masks. Two firemen were overcome during rescue operations. Left: Fireman Robert Foley is being lowered down ladder. Right: Mrs. Strong is being carried to safety. Captain J. A. Briscoe (second from left at top) is being assisted to ladder after being overcome by smoke.

fore, if at a smoky fire flames are visible, and toxic gases are not present in dangerous quantities, the use of filter type masks would normally be safe; on the other hand, if active combustion is not apparent, the safe course would be to use the self-contained breathing apparatus, which is not dependent on the atmosphere near the fire to provide oxygen.

Whenever and wherever there is any doubt about the amount of oxygen present at a fire or the concentrations of poisonous gases, the best rule is play safe—use the self-contained breathing apparatus.

The type of filter mask generally used by fire departments gives adequate protection against ammonia in concentrations up to 3 per cent and other poisonous gases up to 2 per cent which limitations the National Board of Fire Underwriters says are broad enough to cover the great majority of conditions encountered in every day fire fighting. At the same time, the Board warns, it must always be borne in mind there are limits to the protection afforded by this type of mask.

The advantages of the filter mask are its light weight (6 lbs.); relatively compact design; ease and speed with which it can be put on; the length of time it can be used (the canister is good for two hours continuous or intermittent service, if the concentration of toxic gases is low, and its comparatively low initial cost.

Some fire departments carry flame safety lamps, designed to indicate the degree of oxygen in the atmosphere, and use these in conjunction with their filter masks. This mask is considered safe in atmospheres where flame safety lamps are burning, and where dangerous quantities of toxic gases are not present. If the safety lamp is extinguished, the wearer of the mask should return to fresh air immediately.

Self-Generating Oxygen Breathing Equipment

This type consists of a canister that (automatically) generates oxygen, a breathing bag, a face piece and carrying harness. The chemical involvement of oxygen in the replaceable canister occurs by reaction with the wearer's exhaled breath, producing a plentiful supply of pure oxygen in exact accordance with the wearer's breathing requirements. Because of these factors, it is entirely independent of the outside atmosphere and can be worn regardless of how little oxygen is present or how high the concentration of poisonous gases.

This mask is somewhat bulkier and heavier than the filter type and cannot be put in service as rapidly. The canister is rated for 45 minutes but may be used up to one hour under normal exertion, but if the canister is once used, even for a short time, it must be replaced.

The National Board points out that care must be taken in the disposal of the used canisters, which should be punctured and put in a pail of water to prevent them from coming in contact with any oil, which might cause an explosion. Furthermore, the Board states that the caustic solution that will be formed could cause burns, especially to the eyes, and should be handled with care. This mask is approved by the Bureau of Mines.

Fireman, Wearing Respiratory Protective Equipment, Enveloped by Ammonia Fumes at Oakland, Calif., Recently, When Railroad Tank Car of Ammonia Sprung a Leak. Twenty City Blocks Were Involved, and Approximately a Thousand Persons Were Evacuated

Chemox Self-Generating Oxygen Breathing Apparatus

Demand Type Breathing Equipment

The demand type breathing equipment consists of a cylinder of compressed air or oxygen, valves and regulators to regulate passage of the cylinder's contents during inhalation, a face piece and carrying harness. Like the self-generating type, these can be worn safely under any atmospheric condition.

The wearer opens the air or oxygen cylinder valve and the demand regulator automatically supplies the amount "demanded." The exhaled air or oxygen is not rebreathed, but escapes into the atmosphere.

There are several size cylinders made to hold 10 minutes to 30 minutes supply. Authorities generally recommend that the operating period should be at least 30 minutes where the wearer is performing manual labor.

These types of breathing equipment are rapidly becoming the main reliance of the fire service just as they have in the armed forces. They also are widely used by industries.[a]

The same precautionary advice should be given with respect to these units that apply to the filter type mask: wearers must be thoroughly trained in their operation and all equipment should be maintained at perfect operating efficiency; furthermore, there should be sufficient equipment to outfit at least two members of the first-due fire forces responding on any fire or emergency call.

Miscellaneous Masks, Including OCD

A number of other type masks may be encountered in the nation's fire service. One of these is known as the oxygen re-breathing type and it consists of relatively small cylinders of oxygen, together with the customary face piece, necessary regulating valves, a breathing bag and chemicals to remove the carbon-dioxide from the exhaled breath. It is said that utilization of oxygen from the exhaled breath permits a longer period of use from a small cylinder.

Another type, used by some depart-

[a]Sling Types are designed to operate for 7 and 15 minutes at extreme exertion. They are not presently approved by the Bureau of Mines.

ments is the Hose Mask—called by some the "smoke mask." This has a customary face piece, to which is fastened one end of reinforced hose, sometimes 150 feet in length. The other end is attached to a hand operated centrifugal blower. As long as the blower and operating attendant are in clean, uncontaminated air, the wearer is independent of the atmosphere surrounding him. There is no limit on the length of time this unit may be used.

A serious hazard of this type of mask, not found in the previously described types, is that any heavy material may drop on the hose, thereby cutting off the supply of air. It is also subject to jamming and kinking and to leaking in water or other liquids.

Although through FIRE ENGINEERING, the fire service has warned against civilian masks distributed by OCD during World War II, they are still encountered in some fire departments and disaster and rescue units. They are of no real value in fires (even if they have not deteriorated over the years); in fact, they are a hazard and a detriment. They are liable to create a false sense of security to the wearer and where encountered, should be discarded.

Midget Mask

It must not be believed that either fire chiefs or manufacturers of respiratory protective equipment have abated their efforts to further develop and perfect this important facility. At the Cleveland convention of the International Association of Fire Chiefs an impassioned plea was made for a small, general utility mask for the fire fighter. Such a mask has been developed and is said to meet the chiefs' needs for protection. It was shown to members of the same Association at its New York, 1947, Convention by Harold J. Burke, at that time Chief of the New York Fire Department. He referred to it as the "Midget Mask."

It is a small unit, the size of a man's fist, having a mouth bit and nose clip, which gives 15-minute protection against smoke and 1 per cent carbon monoxide only. It does not afford protection against other gases, which of course is its most serious limitation. It is made to be carried in the pocket ready for use, and according to Chief Burke "seems ideally adapted to those short smoky fires that defy approach without respiratory protection." It is a "oneshot" unit, and must be replaced after each use. Thus far, it is reported that no suitable closure for sealing the device against moisture has been perfected. Hopcalite, the carbon monoxide catalyst which is the same as in the filter (all-service) masks, will deteriorate from moisture, therefore, the need of an effective seal until actual use.

Some Limitations

Summing up the uses and limitations of present day respiratory protectors (including filter types and self-contained breathing types) together they provide 100% respiratory protection against smoke, gases, vapors and oxygen deficiencies. Such protection, however, does not provide against the taking in of poisonous gases through the pores of the skin, such as will result from prolonged exposure to hydrocyanic acid gas, for example, nor the irritating effects of ammonia gas in high concentration in the air.

For protection against these and other like gases, gas-tight, rubber protective clothing is necessary.

Unless the equipment is fitted with speaking diaphragm or speaking exhalation valve, the wearer is cut off from communicating with the outside, or fellow workers, except by signal line. This fact, together with possible presence of blinding smoke, making vision difficult if not impossible, calls for courage, coolness and care in operation—and absolute familiarity with the equipment.

It is good practice for men to operate in pairs. Where possible trail a life-line or signal line. It is also well to have at least two "stand-by" men with masks on and ready, for immediate use.

Wearers should use caution in donning masks; see that face piece fits snugly; hose is unfouled; valves in working order and, with the filter-type, that canister seal is removed before operating. Manufacturers instructions should be followed carefully. Operating with breathing apparatus, the gauge must be watched closely and wearer should leave the dangerous area in sufficient time to reach clear atmosphere before his supply of air or oxygen is exhausted.

Experience urges the importance of training all firemen in the use of masks and breathing equipment under every conceivable condition. The wearer of even the simplest respiratory protective equipment must know its limitations and applications. Wearers of self-contained breathing apparatus must have a thorough knowledge of the design, construction, charging, operation, testing for tightness, and cleaning of the apparatus in order that they may know if the apparatus is in fit condition for use and be able to make minor adjustments when necessary.

Firemen should work with all types maintained in their departments;—it is well for them, also, to know the makes and models not in their department, but with which they may come in contact.

The principal need is training in wearing the mask—working with it under actual and simulated fire and rescue conditions. Practice should include handling hose lines, forcible entry, climbing ladders, and other evolutions. Only in this way will men gain the necessary skill and confidence they must have in order to make fullest and safest use of this type of equipment.

Many fire departments do not permit men wearing gas masks to enter a smoke charged building without first having life-lines fastened to them. It is also the custom in many departments never to send men into such structures except in pairs, regardless of what type of mask they may use.

At present there is no standard procedure on these details. There is, however, considerable evidence to recommend the operation of men in pairs and of using a life line, or signal line on mask wearers. In many departments, as we have pointed out, there are insufficient masks and breathing equipment to permit men working in teams, even though the officers would like to adopt that strategy. Fortunately, this situation is improving daily as more and more organizations insist on giving their men the necessary respiratory protective equipment.

The National Board of Fire Underwriters has this to say on this question:[4]

"When using protective breathing equipment, at least two men properly equipped should enter the building together whenever possible; frequently, a line is fastened to them to be used for signaling or guiding them out of the building."

It should be remembered that in many cases some masks are used under conditions that make seeing and hearing difficult, if not impossible. Usually the greater the need for such protective equipment, the denser and perhaps more hazardous the smoke and fumes.

The ordinary flashlight seldom furnishes sufficient illumination to guide men, whether mask equipped or not, under these conditions. Here again enters the matter of coordination of both men and equipment on the fire ground. Two men, working together under such con-

[4]NBFU Special Interest Bulletin No. 282—*"Use of Protective Breathing Equipment."*

(*Continued on page* 122)

Firemen, with Respiratory Protective Equipment Ready for Use, Employ Fog Nozzle to Absorb Ammonia Fumes from Air Near Tank Car Which Sprung Leak at Oakland, Calif., Recently

Second Major Hospital Fire Takes Forty-one Lives

Iowa's Worst Holocaust Discloses That Lessons of Hospital Fire of Nine Months Ago Have Gone Unheeded

A STAFF REPORT

Editor's Note: FIRE ENGINEERING is indebted to Harry Corcoran of the Iowa Inspection Bureau for much of the information upon which this report of the Mercy Hospital, St. Elizabeth's mental ward, is based. Appreciation also is expressed to the National Board of Fire Underwriters, the several Iowa fire chiefs and others, including correspondent Earle Robinson, who sent factual data. It is regretted that lack of time prevents inclusion herein of the detailed operations report of the Davenport Fire Department, Chief Lester Schick, and the Iowa Fire Marshal's Office, Zach Cook, Chief Fire Marshal, which were not available at the moment. The report of the Iowa Inspection Bureau, just released, from which we have borrowed freely, is an excellent document.

FORTY-ONE persons, all of them women, lost their lives as a result of Iowa's worst holocaust, in the destruction of the St. Elizabeth's Mental Ward of Mercy Hospital, in Davenport, Ia., in the early hours of January 7, 1950. A woman patient of the institution, who confessed to setting the blaze, was judged insane, and charged with murder.

The tragedy, coming nine months after the burning of St. Anthony's Hospital, Effingham, Ill., with loss of 77 lives, and at a time when the entire subject of safety in hospitals and kindred institutions has been uppermost in the minds of fire protection engineers, parallels in many ways the Effingham tragedy of last April, as is pointed out in the editorial in this issue.

Burned Building One of a Group of Five

St. Elizabeth's Psychiatric, or Mental, Ward as it was known, was part of Mercy Hospital, located in a residential area of Davenport, Iowa, about two miles northwest of the city's business district. Davenport a city of about 80,000 population, is located on the Mississippi River across from Rock Island and Moline, Ill. Mercy Hospital, largest in the city, serves a wide territory in the Tri-City area and beyond.

The Hospital is administered by the Sisters of Mercy, a Catholic order. It was established in 1868 by persons of all creeds to serve the neighborhood. The unit involved, St. Elizabeth's, was erected in the 1870's and was the oldest of the group of five buildings.

The structures comprising the Mercy Hospital group occupy a two-block area of about 600x500 feet, bounded partially by West Lombard and Marquette Streets. The main structure, which was not involved in the fire, consists of attached buildings of four to six stories and basement, of fire resistant construction, including brick walls, concrete floors and roofs, tile and brick-faced curtain walls, tile interior partitions, and enclosed stairways and elevators. This main hospital building is divided by four 12 and 16-inch walls having connecting doors on all floors. However, the corridors do not extend the entire length of this building. This unit is connected by means of a tunnel with what is known

Firemen Removing Patients from Top Floors

Left: Several spectacular rescues were made from this window via the 65-foot aerial ladder. Note barred and screened windows, some curtained, and wood roof construction. Here Bettendorf firemen are aiding Davenport or other firemen. Right: Difficulties under which rescuers worked is shown by this removal of woman patient in night attire, through lower section of a barred window. Here the entire lower section has been pried up.

as St. John's Building, a companion structure to the ill-fated St. Elizabeth's. St. John's houses the male mental patients of the hospital, whereas St. Elizabeth's was for the female cases. Another tunnel connects the main building with the boiler house, approximately 200 feet distant. This boiler house was the nearest building to St. Elizabeth's but was never in very great danger during the fire. In addition to the central heating plant (steam) the one story and basement structure houses the laundry.

The main building has three outside conventional metal fire escapes. Both the St. Elizabeth's and St. John's Sections had only a single conventional fire escape. There are no metal chute escapes in the hospital. None of the buildings of the hospital is sprinklered nor do any have fire detection and alarm notification systems of any kind.

As will be noted by referring to the floor plan of the St. Elizabeth's ward (the burned building) one stairway west of the long hallway led up through the center of the building. This interior stairway, was enclosed with wood lath and plaster. There was also a dumbwaiter shaft almost directly across the main corridor from the central stairway, also framed with wood, wood lath and plaster. The doors of this dumbwaiter recently had been metal covered, we understand, upon insistence of the fire department. Another outside stairway was located at the rear or north end of the building. The one fire escape on St. Elizabeth's was located about the center of the east side of the building near where the fire is believed to have started.

St. Elizabeth's was of brick and wood joisted construction, nominally considered two stories in height with basement and attic, although the basement floor was entirely above grade at the rear. The main floor, shown in the accompanying floor plan, was directly above the basement; the next floor above is referred to in this report as the second floor and the top floor is referred to as the attic. Reference to the photographic illustrations will explain this detail. The area of each floor measured approximately 7,000 square feet, except in the attic, where only the higher central portion and dormers were utilized.

Fortunately, both the St. Elizabeth's building, which burned, and the St. John's ward were well detached from the main hospital buildings, a factor which aided the department in confining the fire to the single ocupancy.

At the time of the fire a total of 65 persons are known to have been in St. Elizabeth's, all but three of them women. The three males were patients who were temporarily quartered there for special treatment. No male hospital attendants or aides were reported in the building at the start of the fire. Two women attendants were on duty, a nurse on the main floor, and a nurse's aide who was sleeping on the second floor.

Attention has been called to the long, unbroken corridor or hallway dividing the structure. There was only one door on this long passageway which was located about 50 feet inside the south entrance of the building. From it, two doors, right and left, led into a bedroom and a parlor, or reception room. The corridor continued beyond this door through the brick partition wall, with no fire stops. Neither the doors opening into the stairs nor on the dumbwaiter were automatic closing. They were supposed to be locked when not in use. Four old brick vent flues, with openings in each story, extended up to the eaves. On the southeast corner there was a sun porch with barred or screened windows.

The interior walls and partitions were largely finished with wood lath and plaster; in later alterations some composition board and plaster board were reported installed. The wood lath on the exterior walls was nailed to one-inch furring strips. The hallways had wood wainscoting four feet high. This was carried into most of the rooms. Ceilings were metal sheathed, except in the hallway on the main floor, where a suspended combustible fibre board ceiling had been installed, leaving a four-inch concealed space between the original ceiling and metal ceiling.

There is some difference in the reports of the doors leading into the patients' rooms and in the hallway. These were all reported of wood construction, but not all accounts mention the use of glass in doors or transoms.

The reported "confession" of the patient who allegedly set the fire mentions that "after the curtains were well ablaze she broke the glass in the transom above her door and escaped into the corridor," and that she was treated for "severe lacerations suffered in climbing through the transom."

A report on fire operations also mentions a fire officer observing fire through a closed door in the passageway.

The reception room for patients, the parlor and office were on the main floor front or south section of the building, almost directly over the kitchen and dining room, located in the basement. Ironically enough, after the fire, dishes, laid out for the next meal, were found on the dining room tables, most of them filled with water from fire hoses.

Active patients (undergoing treatment) were located in individual rooms on both sides of the main floor corridor (see diagram) extending back from the reception room and office. The arrangement of the second floor was somewhat similar to that of the main floor and was a dormitory for the more tractable patients. About fourteen patients were reported quartered in a long narrow ward in the attic. These were said to be ambulatory, most of them being seniles who performed light tasks

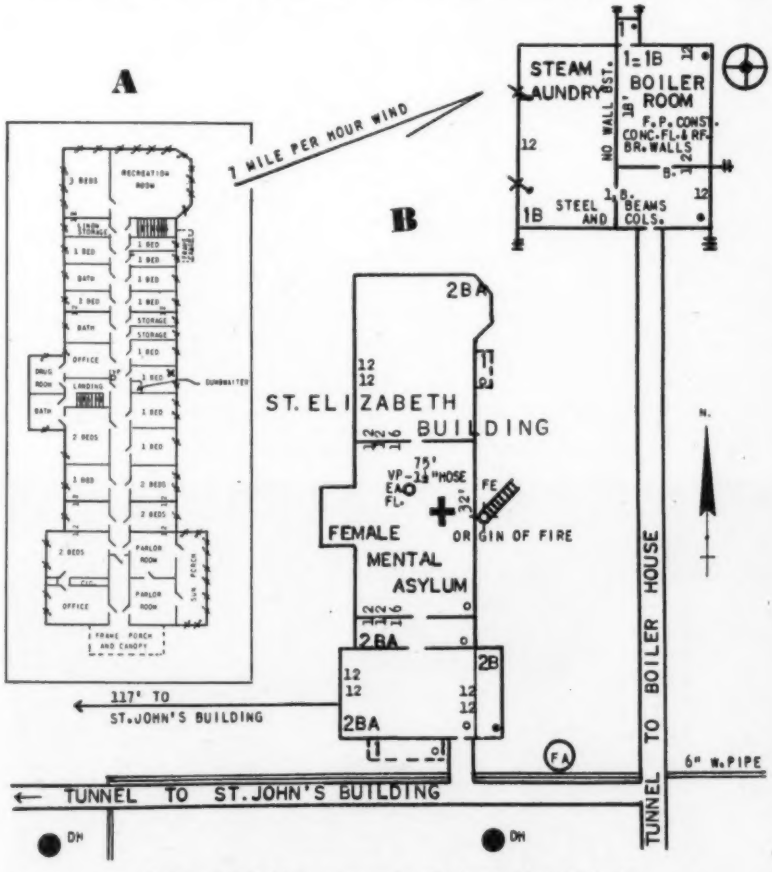


Diagram of Building Layout—St. Elizabeth's Mental Ward

"A"—Showing arrangement of main floor, according to information obtainable after the fire. Fire believed to have started at "X," near main stairs and dumbwaiter. Both interior stairs and dumbwaiter were enclosed with wood lath and plaster. Note lack of doors on long corridor and openings through brick partition walls. Windows were barred or fitted with grilles.

"B"—Layout of St. Elizabeth's Building. Note fire escape on east side; vertical pipe extending through each floor; brick partition walls. Steam laundry and boiler room with chimney, upper right. *Legend:* "2BA"—two stories and basement and attic; "2B"—two stories and basement. "VP.EA.FL"—Vertical pipe. each floor thickness of walls indicated by figures; right hand figure being lowest floor. "FA"—Fire alarm box (not used); "DH"—Department hydrants (used); "6" w.pipe"—water supply line to hydrants. Diagrams not to scale. Wind direction indicated—velocity 7-10 MPH. Adapted from Iowa Inspection Bureau Report.

in the kitchens or portions of the hospital.

Electric wiring was in conduit and armored cable; wiring on the main floor had been overhauled by competent workmen during alterations. Heat was steam, supplied from the central heating plant. It is reported cooking devices in the kitchen were intact after the fire.

Hospital Security Measures Handicap Firemen

Security measures designed to prevent escape of the mental patients, in the form of barred and screened windows and locked doors, added to the difficulties of the fire fighters. Practically all the windows in St. Elizabeth's were securely barred on the outside or protected by heavy wire grilles. The bars consisted of steel rods spaced four inches apart on three flat horizontal bars which in turn were attached at each end to the wood window frames by large screws. It is reported that, with one exception, it was necessary to chop the wood framing out at all three points on one side of the frame before the bars could be pried away. The exception was one window on the second floor where the bars were hinged at one side and secured by means of a hasp arrangement at the opposite side. This particular window was an important factor in rescue operations.

Rescue operations conducted from ladders, even where those being rescued are able to assist firemen and where entry is easy, and where weather and other conditions are ideal, are difficult at best, but when patients are elderly and helpless and firemen must force entrance, then plunge into smoke and flame to bring out the stupified and hapless victims, with the temperature at 19 above zero and a 7 to 10 mile an hour wind blowing, the problem is far more complicated. It is to the credit of the Davenport and other fire fighters, aided by policemen and volunteers, that so many were saved in the face of the handicaps.

As a further security measure, the doors opening into the stairshafts were locked on each floor. Exterior doors also were locked except at the main front entrance. Locked doors separated the office and reception room from the patients' quarters. The hallway in the patients' quarters was also accessible from the office by a door concealed in a closet, this door being equipped with a spring lock on the office side. It was intended purely for emergency use should the attendant outside need help. There is no indication that this was ever used in the fire. Doors to individual rooms along the hallways were not locked except where it was necessary to isolate an individual patient.

To just what extent the locked doors delayed or blocked escape of patients or staff has not as yet been determined. The interior of the structure was so badly gutted and bodies were so buried in debris that their relation to any exits could hardly be determined. A nurse's aide, who escaped from the third floor, commented in her testimony on the barred windows. She made her escape by the stairs before they were involved, reaching the basement and an exit.

Fire Fighting Operations on East Side of Building

North section of burning building almost fully involved. Firemen setting lights. Fire escape at left is about center of building near where fire is reported to have started. Firemen were later driven from this leeward position.

The building was equipped with a single standpipe located in the center of the structure, fitted with 75 ft. of 1½-inch linen hose on each floor. There were also chemical extinguishers provided on floors. All these were practically useless, however, even if anyone had been available to use them, because they were located behind locked doors in the stair shafts!

No Organized Training Program

Reports current at this writing indicate, furthermore, that there was no organized program either for training the staff of the building in the proper use of first aid fire fighting equipment, or for evacuating the patients in time of emergency. As has been said, apparently, no male attendants or aides were in the building at the time the fire was reported.

The policy of turning in alarms for fire, or for any emergency requiring outside help, was to use the telephone in St. Elizabeth's office, to call the main hospital building from whence the desired action would be taken. It is reported the fire call for St. Elizabeth's was handled in this manner. There were no fire alarm boxes in the building or direct connections between fire department and St. Elizabeth's, nor were there any fire detecting devices in the structure. There is a public fire alarm box near the entrance to the hospital, almost directly between the two buildings but this was not used.

Fire Believed Set

The fire was first noticed by an orderly in the main hospital shortly after 2:00 A.M. At that time flames were clearly visible at the windows near the fire escape on the main floor. At almost the same time this attendant noticed the fire, it was seen by a woman member of the staff on duty on the fourth floor of the main building of Mercy Hospital, the obstretrics ward. She said she saw a "red flash" coming out of a window of St. Elizabeth's and notified her superior, Mrs. Frances Kelly, who turned in an alarm.

After calling to other employes to notify the fire department, the male orderly ran to the front door of St. Elizabeth's, entered the building, and report-

St. Elizabeth's Fire at Its Height

A fire department pumper stands on the frozen ground on the west side of the burning building. The light southwest breeze carried the flames and heat away from St. John's ward about 117 feet distance (not shown in picture). Even at this stage, firemen were still attempting rescue.

As Dawn Came—Firemen Begin Search for Victims

View of east side of wrecked St. Elizabeth's, showing fire escape and Ladder 3, which was used effectively, on driveway. Of 65 persons in structure when fire started, 26 were saved, two dying later. View was taken from main hospital building.

edly attempted to get into the patient's quarters, after breaking the glass in the front doors, where he was met by considerable fire. He then returned to the main building "to make sure the fire alarm had been transmitted" and by this time he could hear the first fire department companies approaching. At about this same time, the nurse's aide, previously mentioned as sleeping on the third floor of the mental ward, was awakened by screams and escaped down the stairs and out through the basement.

Following the investigation into the origin of the blaze by the fire department and state fire marshal's office, 23-year-old Mrs. Elnora Epperly, a patient, confessed she set the fire. She told state and Scott County authorities that she ignited curtains in her room at the institution with a cigarette lighter which her husband had given her for a Christmas present. "I was afraid someone was going to kill my husband and I wanted to get out," she said by way of excuse. She ignited curtains to attract attention of attendants, then pounded on the door, and a nurse let her out. She said she then broke a glass panel in another door to gain freedom.

Mrs. Epperly, a voluntary patient, had been in the hospital four weeks, and ironically was to be released the day of the fire. Her husband told authorities he believed his wife's confession. C. W. Cornell, Iowa Deputy Fire Marshal, and local officials said the woman's story corroborates the findings of their investigation. She had a room on the first floor center of the building, near a fire escape and they said they believed the fire started in her room.

Sprinkler System Recommended—Never Installed

According to Iowa State Fire Marshal Zach Cook, who took over the office from former Fire Marshal John Ströhm last July, the hospital was inspected about two years ago. The Marshal is quoted as saying that inasmuch as his department includes only five men, such inspections are made only on the request of the city and county authorities. A more recent inspection of the hospital had not been asked, according to Cook, who is also quoted as saying he could not recall the state making any general or specific recommendations to hospitals intended as fire prevention steps.

It is said that Davenport fire authorities and a representative from the state office made an inspection of the hospital in April, 1948. Fire Chief Lester Schick is reported as recalling that, during a tour of the buildings, the installation of a sprinkler system was discussed. He was unable to explain why it was not included in the report from the state office.

In discussing the fire, Chief Schick said a sprinkler system probably "would not have prevented the fire, but it would have kept it under control long enough so firemen could enter the building and possibly rescue more patients."

Chief Schick emphasized the need of the new fire prevention ordinance presently under consideration by the city council. This includes a section covering sprinkler systems. "Where the difficulty arises," according to the Chief, "is making the law retroactive." Fire officials throughout the state, he said, are handicapped in their fire prevention work because they have no backing under state law. There are at present no state laws requiring installation of sprinkler systems in public buildings. The Chief also expressed the opinion that the state fire marshal's position should be taken out of politics and placed under civil service. "In the interests of the public," he said, "the state fire marshal's office should be a separate division rather than under the control of the Department of Public Safety as at present." He added "if the fire marshal and the inspectors were under civil service, they would be in a more favorable position to enforce the law."

Firemen Center Operations on Rescue

The first alarm was received by the fire department alarm bureau at 2:06 A.M., by telephone from the hospital. This was responded to by three engine and two ladder companies under command of an Assistant Chief. The first-in units were Engines 6 and 3; No. 6 coming from its station at Fourteenth and Marquette streets, approximately 10 blocks away. With Engine 3 came Ladder 2, a 65-ft power-operated metal aerial, from No. 3 station on Locust, near Iowa street; slightly over a mile distant. In addition, the response brought Engine 5 and the department's new 85-ft. metal aerial ladder from No. 5 Station, on Rockingham, about two miles away.

Almost immediately upon his arrival at the scene, the Assistant Chief radioed for help. This second alarm went out at 2:10 A.M. and brought three additional engine companies and the 100-ft. metal aerial from headquarters. At this time off-shift firemen were summoned, most of them responding to the further alarms recorded at 2:15 and 3:15 A.M.

Fourteen of Davenport's 17 fire companies were in operation by 2:30 A.M. Of the total of 88 members of the fire department, 67 were mustered into service. All told, 107 firemen are said to have fought the blaze, aided by the "Second Alarmers," Davenport's organization of fire buffs, police, hospital attendants and staff members, and other volunteers.

When Engine 6, in charge of Lieutenant Al Koranda arrived, flames were coming from two windows near the fire escape on the main floor and one or two windows directly above on the second floor. The three-man company stretched from the nearest hydrant to the fire escape. As the Assistant Chief approached a moment later, the flames were visible above the roof of the intervening hospital building. Patients were already at many windows and the necessity of prompt rescue work was apparent. The call for additional aid was radioed through the Police Department radio to fire headquarters.

(*Continued on page* 146)

Air View of Mercy Hospital with Burning St. Elizabeth's

View looking south toward main hospital buildings. Boiler plant and chimney partially hides the gutted women's mental ward. Corner of St. John's, companion unit housing male mental cases, is shown at upper right.

F.D.I.C. HOLDS OUTSTANDING CONFERENCE IN MEMPHIS

Retiring Host Chief Connie O'Sullivan Honored by Delegates From 37 States and Canada

RAINS and floods and sleet storms in the Mississippi tributaries; drought in New York and New England; fires in Ohio, Iowa and elsewhere, could not stay the trek to Memphis of 700 representatives of the fire service, and others affiliated with it, to the Fire Department Instructors Conference, Jan. 10-13.

The occasion marked the eighth and final Conference to be held in Memphis, the nation's prize-winning fire prevention week city, during the tenure of Chief Connie O'Sullivan as head of the Memphis Fire Department. Chief O'Sullivan retires as chief of that department next June. Eight previous Conferences were held in the same city during the regime of Chief Irby M. Klinck, Chief O'Sullivan's predecessor. Interestingly enough, the official scheduled to succeed Chief O'Sullivan is former Chief Klinck's son, John.

As usual, the Conference was sponsored jointly by the Fire Prevention Department of the Western Actuarial Bureau of Chicago and the Fire Department of the City of Memphis, through the support and interest of Chief O'Sullivan and Commissioner Joseph P. Boyle, vice-mayor. As usual, also, the dynamic conference director, Richard E. Vernor of the Western Actuarial Bureau, sparkplugged the affair, with his aides, Emmett T. Cox, Harry Wolff (former Captain, Chicago Fire Department, and a long-time participant in the Conferences, who recently joined the Western Actuarial Bureau), and J. E. Barman, inspector, Missouri Inspection Bureau, St. Louis, Mo. Wm. R. Ford, Factory Insurance Association, and Lew F. Holland, Historian of the F.D.I.C., handled the publicity. Only three of the original group which launched the F.D.I.C. many years ago were present this year. They were Richard Vernor, James J. Just, and Capt. W. D. Rogers. A namesake of Mr. Rogers, and another pioneer, Harry K. (Smoky) Rogers was prevented by illness from participation this year.

Living up to its unique reputation for split-second timing, the Conference got under way, Tuesday, Jan. 10, at 9:00 A.M. sharp, with an invocation by Monsignor M. F. Kearney, pastor, Immaculate Conception Catholic Church. In his introductory remarks, Mr. Vernor traced the development of the F.D.I.C., crediting the International Association of Fire Chiefs for the idea that inspired the getting together of firemen and fire instructors back in 1928. He expressed gratification over the increased attendance in the Conferences by industrial fire protection chiefs, and other officials. Speakers in the morning sessions included Mayor Watkins Overton, of Memphis; Joseph P. Boyle, Vice-Mayor and Commissioner of Fire & Police; Chief Connie O'Sullivan; Harry Woods, County Council of Civic Clubs, and A. P. Mills, Chairman, Fire Prevention.

Ben E. Harris, Asso. Dir. T & I Education, U. of Alabama, led off the business sessions with his paper, "Here We Go Again," to put the delegates in the right mood. He was followed by a panel on "Weather," participated in by J. W. Davis, Asst. Chief, Miami, Fla. (Winds); H. C. Williams, Asst. Chief, Cincinnati, O. (Floods); L. W. Hoeft, Dep. Chief, Milwaukee, Wis. (Snow). H. R. Brayton, Dir. Texas Firemen's Training School, served as leader.

W. A. Ross, Consultant, U. S. Dept. of Education, Washington, was chairman of the luncheon Tuesday, the speaker being Harold J. Burke, former Chief, New York Fire Department, whose topic was "Climbing Ladders." The afternoon session was opened by Chief Roi B. Woolley, Assistant Editor, FIRE ENGINEERING, who discussed "A New Conception of Attack" in which he urged coordinated use of the fire fighters' modern "tools," particularly masks and breathing equipment, small lines and boosters, fog nozzles, water fog and wet water, and portable lighting devices to enable the fire fighter to speed attack and kill fires before they can propagate.

Walter G. Dithmer, Western Underwriters Asso., Chicago, spoke on "Fire Insurance and the Fireman." He was followed by several speakers, including Prof. Jos. L. Lingo, Purdue University, who warned that arson is on the increase; R. C. ("Bob") Byrus, Iowa State College, who discussed "Conference Techniques," and Amos Rowley, Chief, Poteau, Okla., Fire Department, whose topic was "Designating Duties by Number."

Wednesday's business program produced a number of outstanding lectures, including a "quizquery" participated in by John E. Barman, Missouri Inspection Bureau, as "quizmaster," with John E. Hurley, F. D. Instructor, State Dept. of Ed., Little Rock, Ark.; C. E. Murphy, Chief, Spencer Chem. Co. F. D., Pittsburg, Kans.; T. R. Wagner, Asst. Chief, Air Force Base, Rapid City, S. D.; Chief Letcher R. Martin, Henderson, Ky., and L. E. Shingledecker, Mill Mutuals, Columbus, O., participating.

Photo by Hugh Walker

Chief and Mrs. Connie O'Sullivan Honored at F. D. I. C.

Left to right: Director Richard E. Vernor (F. D. I. C.), Chief Connie O'Sullivan and Mrs. O'Sullivan shortly before presentation was made to them by Conference.

Chief Lloyd Layman, Parkersburg, W. Va., gave delegates considerable food for thought with his paper, "Little Drops of Water," in which he contrasted fire extinguishment using solid streams and broken up water particles, such as water fog and steam.

J. W. Mills, Fire Prev. Dept., Frigidaire, Dayton, spoke on fire prevention teamwork, after which a number of topics were handled in rapid fire sequence. The first on "Oxygen Masks" was by Lieut. T. C. Dickson, Lincoln Park, Mich.; J. Bertrand Smith, Instructor, Fifth Naval District F. F. School, Norfolk, Va., told how the Navy trains fire fighters; R. E. ("Dick") Vernor reported on the progress made by the Joint Evolutions Committee, and W. Roy Ford, Dir., Dept. of Information, Factory Insurance Asso., Hartford, Conn., gave delegates ideas on national fire prevention contests. "Getting the Most from Sanborn Maps" was the topic of Harry J. Corcoran, Chief Engineer, Iowa Inspection Bureau, Des Moines.

The luncheon, served by the members of the Memphis Fire Department, was addressed by Henry A. Riterod, Ch. Pub. Relations Comm., State Fire Prev. Assn., Little Rock.

Afternoon speakers included James W. Just, Dir. Fire Serv. Ext., U. of Md.; Tom S. Ward, State Dept. of Education, Sacramento, Cal.; and Melvin R. Freeman, Pub. Relations Mgr., N.F.P.A. A Panel on fire school problems was held in which the following participated: Joe I. Fetters, Nebraska State Dept. Voc. Ed. leader; D. E. Barrett, Asst. Dir., Fire Training, Ontario Fire Marshal's Office, Toronto; H. R. Brayton; J. W. Just; W. Bush Walden, Fire Instr., U. of Mo.; T. S. Ward, Special Supvr., State Dept. of Ed., Sacramento, Calif.; and R. M. Winger, Supt., Pub. Serv. Training, T. & I. Ed., Lansing, Mich.

Memphis Fire Department Photo

Fire Department Instructors' Conference in Session at Memphis

Photo by Hugh Walker

Memphis Fire Department Cowboy Band which Entertained at the F. D. I. C.

Thursday's sessions opened with a quiz and answer program in which the following handled a number of timely topics: Chief Fred J. Wells, Fargo, N. Dak.; Chief C. O. Richardson, Tenn., Eastman Corp., Kingsport; Chief F. V. Vaugoin, Raritan Arsenal, Metuchen, N. J.; A. H. Gent, Chief Eng., Ill., Insp. Bu.; Victor B. Robinson, Fire Instr. Va. State Dept. T. & I. Ed. Chief Wm. S. Allison who heads training activities in the Detroit Fire Department, was chairman.

Fire Chief Anthony B. Mullaney, Chicago, delivered a paper that was packed with pertinent and practical information for fire fighters. Sgt. A. M. Peel, Instructor, District of Columbia Fire Dept., told how Washington trains its pump operators. R. H. Young, Engr. N.B.F.U., spoke on "Fire Dept. Records and Reports," and Robert G. Kooser, Engr. Atlantic Coast Line R.R., introduced some new ideas in fighting fires in diesel locomotives.

Fred Heisler of Oklahoma A. & M., as chairman of the Thursday luncheon, introduced Fred Sharpe, lecturer, U. of Kans., who addressed the audience on "Selling the Fire Service."

"Fire From the Sky" was the subject covered by Melvin Blaising, Independent Protection Co., Goshen, Ind., after which Jim Just and an "all star cast" staged a travesty on fire instructors and instructing. Chief Fred J. Wells of Fargo delivered an enlightening paper on "Reducing Smoke Damage" in which he offered a number of practical suggestions. The evening was given over to entertainment, with the Memphis Fire Department as host.

The concluding day's program opened with another question box session in which Prof. R. J. Douglas, Okla. A. & M. College, was quizmaster.

"The Fire Department's Stake in Building Codes and Fire Prevention Ordinances" was the topic taken by George J. R. Robinson, Eng. N.B.F.U. R. N. Just, Asst. Eng. Underwriters' Lab's, Chicago, discussed oil burner hazards and fires, after which Edward J. Kehoe, Chief, Safety & Fire Prot., U. S. Atomic Energy Commission, N. Y. C., delivered a paper on "Atomic Energy and the Fireman."

The Memphis Fire Department at its luncheon for the day introduced the Memphis Fire Department's Cowboy Band, appropriately garbed for the occasion, and which made quite a hit with the delegates.

Chief Connie O'Sullivan, slated to retire June 6 after 30 years in the department, was presented with a check to cover the cost of building a greenhouse at his home, 2464 Madison, where he indulges his pet hobby, growing flowers. The formal presentation was made by Conference Chairman Vernor. Chief O'Sullivan and Mrs. O'Sullivan were given an ovation by the assemblage.

Chairman Vernor then introduced Deputy Chief John C. Klinck, who is destined to succeed Chief O'Sullivan.

Concluding lecturers in the business sessions were: Warren Y. Kimball, editor, "Fireman," and W. W. Hamilton, Mgr. Chicago Board of Fire Underwriters. As in the past, H. R. Brayton did his "annual broadcast," after which Chairman Vernor brought the four-day Conference to a close.

The 1951 Conference, it is announced will be held in Memphis on Jan. 8-12, with Chief Klinck as co-chairman.

I. A. F. C. Board Honors Booth and Fleming

High point of the winter meeting of the Board of Directors of the International Association of Fire Chiefs at the Statler Hotel, New York City, January 16-18th, inclusive, was the luncheon given by the Board to honor George W. Booth and T. Alfred Fleming, who recently retired from the National Board of Fire Underwriters.

George W. Booth served for 39 years as Chief Engineer and T. Alfred Fleming, for 30 years, held the post of director of conservation in the National Board of Fire Underwriters. The Board of Directors of the I.A.F.C., and visitors, extolled the long and successful career of these stalwart friends of the fire service. Chief William Cawker, president; Chief John Alderson, first vice president, and Jay Stevens, executive secretary of the Association, were the speakers.

All Divisions of the International were represented at the sessions which, as in the past, were also attended by numerous friends of the Association.

The report on the Convention at New Orleans showed it to be in every way, one of the most outstanding ever held by the organization. The reports of the officers and directors and general manager revealed the affairs of the Association to be in good condition. Membership is holding up, most of the Divisions showing an increase in members; Divisional conventions generally have been most successful, and the Headquarters Office in New York City is transacting more business than ever, as reflected particularly in the material sent during the past year to Association members.

Among the Committees reporting were:

PUBLICATIONS: Chief Cawker, Chairman, reviewed the numerous publications distributed and discussed further extension of this essential service.

COMMUNICATIONS: Chief Roi Woolley reported the statewide radio allocation plan approved in New Orleans is being accepted by states. The Committee urges fire chiefs to make applications for radio frequencies without delay and to be guided by the I.A.F.C.'s pamphlet on radio frequency allocation.

The Committee recommended elimination of the tone signal presently insisted upon by the F.C.C. where certain types of messages are recorded. It joined with the International Municipal Signal Association also in recommending re-designing portable pack sets, or walkie talkies, to better adapt them to fire service use. The indiscriminate commercial broadcasting of fires and other emergencies was decried by the Committee, which pointed out the great good, as well as harm, that can come from newscasting. Finally, the Committee reported it was not in agreement with the proposed "International Marine Distress Signal" as urged by the Association of Ports of Authority.

Chief James Keegan, chairman of the sub-committee on Cooperation With the Signal Association, reported on the action taken to bring the two Associations together.

Photo by Hugh Walker

Retiring National Board Officials Feted

High point of the mid-winter meeting of the I. A. F. C. Board of Directors was its luncheon honoring retiring N. B. F. U. officials George Booth, Chief Engineer, and T. Alfred Fleming, Director of Conservation.

Photo by Hugh Walker

Board Members and Visitors Recess for Lunch

Left to right: George J. Richardson, Secretary-Treasurer, International Association of Fire Fighters; I. H. Case, FIRE ENGINEERING, New York; Chief Selden R. Allen, Director, New England Division, I.A.F.C.; Robert Baird, Bi-Laterial Fire Hose Company, Chicago, Ill.; L. E. Lowry, Sales Promotion Manager, The Gamewell Company, Newton Upper Falls, Mass.; John Redmond, President, International Association of Fire Fighters, Washington; William J. Scott, Fire Marshal, Province of Ontario, Canada, and Chief Roi B. Woolley, FIRE ENGINEERING, New York.

RADIOLOGICAL HAZARDS: Matthew Braedich of the National Board of Fire Underwriters, technical advisor to the Association and chairman of this Committee, went at length into the steps being taken to acquaint fire fighters with the hazards attendant upon any atom bombing or other attack. A former representative of the Association in Washington, Chief Carl Dreesen, and others joined in the spirited discussion of this subject.

PRESIDENT'S ADVISORY COMMITTEE: This group, headed by Frederick Philbrick, president Gamewell Company, representing manufacturer-supporters of the I. A. F. C., reported considerable progress made in interesting sustaining members, developing new enrollers and in generally promoting the Association. A number of manufacturers' representatives were present.

BUDGET AND FINANCE: The report of this Committee revealed the Association financially to be sound, with income satisfactory to cover the increasing operations and expenditures of the Headquarters Office. The Committee recommended an increase in salary for Chief Daniel B. Tierney, Secretary-Treasurer, and James E. Jagger, and all headquarters' staff personnel. Also, the Committee submitted a recommended budget for the coming year, designed to meet all obligations yet permit further expansion of the Association's activities. No radical changes in operations are contemplated.

LEGISLATION: Chief Paul P. Heinz, New Haven, reviewed the more important legal developments affecting the fire service, which his Committee had noted emanating from several states and urged fire chiefs to keep a sharp eye out for proposed and contemplated legislation which may have a bearing upon their calling.

EXECUTIVE: President Cawker and the vice presidents, who form the Executive Committee, discussed a number of important administration matters.

THE 1950 CONVENTION: Although there is no convention committee within the Association, Chief Ed. Walsh of San Francisco, who will be host to the forthcoming conference, outlined the steps being taken to assure the Association a most enjoyable and educational gathering. The dates of September 12-15, inclusive, and the selection of the Fairmount Hotel as hotel headquarters, were approved by the Board at his recommendation. The Memorial Services will be held in the spacious Opera House, the business meetings and exhibits in the Main Civic Auditorium. There was considerable discussion over details of hotel accommodations, which will be ample, and the banquet, and educational and entertainment program. With Pacific Coast enterprise as the driving force the "biggest and best convention ever" is promised.

Among those in attendance at the Board's sessions were: President William J. Cawker, Topeka, Kans.; First Vice President, John Alderson, Los Angeles, Cal.; Second Vice President Rudolph Swanson, Jamestown, N. Y.; Secretary-Treasurer, Daniel B. Tierney, Arlington, Mass.; Executive Secretary, Jay Stevens, San Francisco, Cal.; Technical Consultant, Fred Shepperd, New York City; General Manager, James E. Jagger, New York and I. H. Case, New York, Public Relations.

Also, for the Eastern Association of Fire Chiefs: in addition to President Rudolph Swanson, First Vice President, Herbert A. Friede, Washington, D. C.; Secretary-Treasurer & Director Charles E. Clark, Wayne, Pa.; James T. Keegan, Newark; Frank Ertle, Jersey City, N. J.; George Mitchell, East Orange, N. J.; Charles McGinley, E. Orange, N. J., Andrew T. Callahan, Harrison, past-president of the IAFC. and William Wandras, former director.

From New England Division, IAFC: Daniel B. Tierney, Secretary-Treasurer IAFC, Selden Allen, Director IAFC, and Paul P. Heinz, past president of the Division.

The Great Lakes Division was represented by Frank Burns, Grand Rapids, Mich., Director, IAFC and Charles Delaney, past president, IAFC.

The Missouri Valley Division sent Ray Tiller, Director, former president, IAFC, of Waterloo, Ia.

The Southwestern Division was represented by Director G. R. McAlpine of Oklahoma City, Okla.

A new Director, Chief R. O. Noble of Cordele, Ga., represented the Southeastern Division. Illness in his family kept outgoing past IAFC president Henry Chase of Miami from attending.

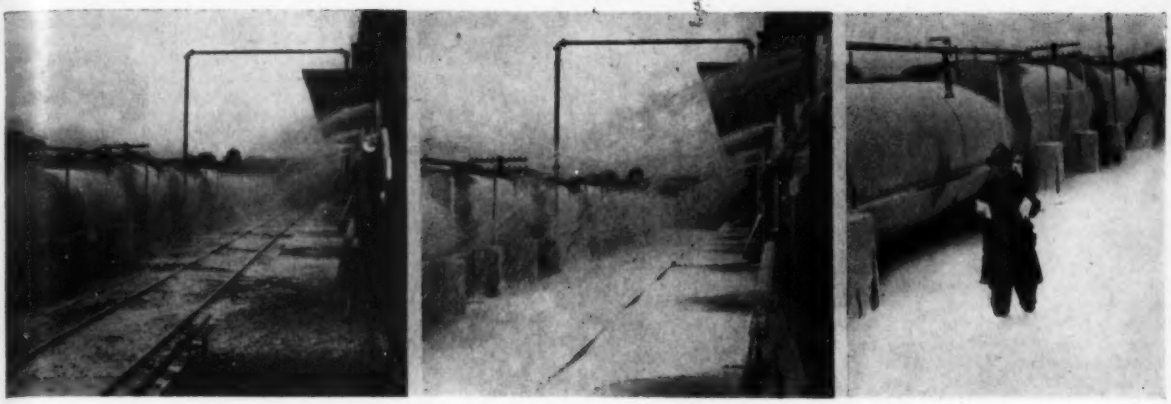
Pacific Coast and Inter-Mountain Division sent Second Vice President John Alderson, Los Angeles; Executive Secretary Jay Stevens; also Chief Ed. Walsh of San Francisco and Director William Meinheit of Berkeley.

The Dominion Division sent its President Chief Robert McRonald of London, Ont., and Fire Marshal W. J. Scott of Toronto.

Photo by Hugh Walker

I.A.F.C. Officers at a Board Luncheon

Chief John Alderson, Los Angeles, First Vice-President, and Jay Stevens (hand raised), San Francisco, flank President William J. Cawker, Topeka, Kans., while Chief Daniel B. Tierney, Secretary-Treasurer, looks on.



Testing New Mechanical Foam System at Schenectady Varnish Company Plant, Schenectady, N. Y.

Left: Eighteen seconds after system started operating. Center: Foam blanket well formed at end of two minutes. Right: At the end of three minutes. Note coverage and depth of foam blanket.

AUTOMATIC FOAM SYSTEM PROTECTS OUTSIDE HAZARD

Varnish Plant Installation Guards Against Fires Involving Railway Tank Cars Carrying Inflammables

A GOOD example of the use of mechanical foam in industrial plant fire protection is the installation recently completed and tested at the Schenectady Varnish Company, large manufacturers of synthetic resins and insulating varnish, at their Schenectady, New York, facilities.

The basic problem at this plant was the control and isolation of a spill fire which might occur at tank car unloading locations and flammable liquid storage tanks on the 25 to 40 foot wide railroad spur located between the plant and the main line of a railroad. Materials as light as naptha and benzol are stored and handled in this area which is practically inaccessible to city fire department operations.

The Schenectady Varnish Company, realizing the seriousness of the potential fire hazard to their plant from this unloading area and to the continuity of their operations, requested the Engineering Department of the Factory Insurance Association to study the problem with a view of making certain recommendations relative to protection. The engineers of this group determined that standard methods of protection or relocation of the area alone would not be feasible, either from a production or economic point of view. They therefore suggested that a study be made of the adaptability and economic value of the use of mechanical foam for this occupancy.

Completion of this study indicated that positive protection could be obtained through the design of a mechanical foam system automatically controlled by means of Underwriters approved rate-of-rise deluge sprinkler system valves.

The Schenectady Varnish Company subsequently commissioned the "Automatic" Sprinkler Corporation of America to design and install such a system, subject to the approval of the Factory Insurance Association.

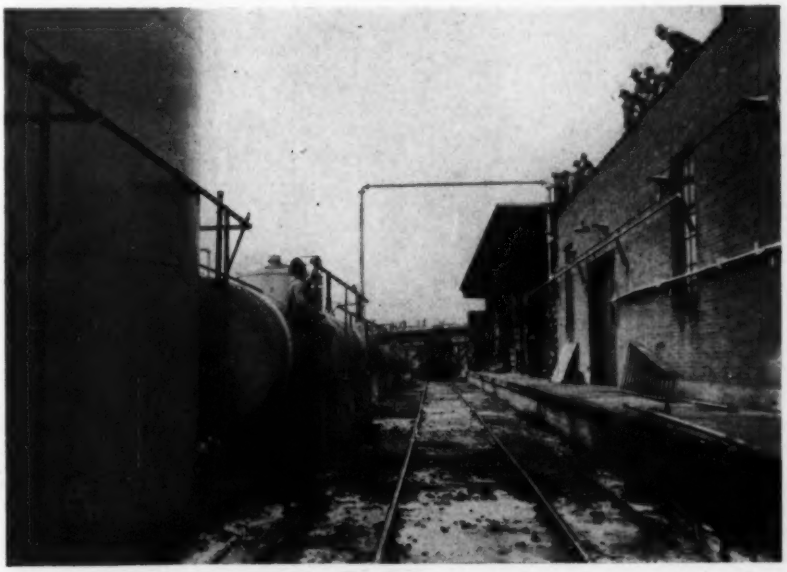
Basic design study indicated that:

1. The foam system should be automatic, because:
   a. Flammable liquid fires may cause failure of piping, fittings, valves, etc., within a very few minutes, thus adding additional volatile liquids to the original fire.
   b. Personnel on night duty at the plant were not located in the protected area.
2. The systems should establish immediate protection over that area which would be involved in fire.
3. The foam blanket should be such as to prevent flashback of fire for several hours.
4. The foam liquid should be available in adequate quantity so as to extinguish one fire with an equivalent reserve charge.
5. Adequate portable mop-up equipment should also be provided.

Using these basic points, a layout was designed, engineering data developed and systems installed subject to Factory Insurance Association approval. Full scale operating tests were made on these systems for all interested parties.

System Design, Mechanical Operation and Tests

The area protected varies in width between 25 and 40 feet and is about 450 feet long. It is divided into three system areas. Protection for each area is regulated by means of one six-inch deluge valve, actuated pneumatically by pressure impulse from pneumatic heat detectors, which are strategically located



Loading Platform of Schenectady Varnish Company and Railway Sidings Which Are Protected by Mechanical Foam Installation (Aer-O-Foam). System Installed by "Automatic" Sprinkler Corporation of America

throughout the areas protected by each system.

The mechanical functions of the system are based upon the integration of two operational units as follows:

1. Deluge sprinkler system operation employing the same type of deluge valve which has for many years been utilized for operation of water spray and deluge sprinkler systems for the protection against flash hazards, such as munitions manufacture, spray painting, aeroplane hangers and the like. The piping for this system is galvanized and hydraulically designed so as to provide a maximum efficiency of water usage. Each piping system is equipped with between 16 or 17 overhead foam aerating and discharge devices. The discharge pressure at these devices is about 75 PSI giving a total foam discharge of about 8800 GPM per system. These systems are equipped with alarm gongs, supervisory features and other types of devices required for approved sprinkler systems.

2. The foam storage and injection system consists of a small foam injection pump which takes suction from a double compartmented 800 gallon foam liquid storage tank. It provides for the discharge of foam liquid into a piping system which distributes the foam liquid to the three systems and to the nine portable hose stations located within the plant. One side of the foam liquid storage tank is always open as suction to the foam liquid pump. The other side of the storage tank is kept closed so that the system may be immediately returned to service following operation from fire. Metering of the foam liquid into the water piping system is accomplished by means of orifices. These are controlled by small companion valves operated pneumatically by six inch deluge valves. The foam liquid operation is supervised by a 50 gallon cushion tank which will supply several minutes of foam operation to the portable units within the plant before the foam liquid pump cuts in from low pressure. The particular advantage of this foam distribution system is that it can be extended to use for similar additional systems or hose stations, simply by extending the piping and installing a proper sized orifice between the distribution piping and the new system. Full foam making capacity is thus available for use at any location within the plant.

Optimum foam making quality is based on a figure between five and six percent injection of foam liquid into water. The foam liquid injection was designed for these systems in such a manner as to allow for pipe aging and reasonable changes in water supply pressure. The system should operate efficiently for many years without the necessity of orifice adjustment. When mixed with water and aerated, the foam liquid in one compartment of the storage tank will form 58,000 gallons of mechanical foam or a total of 116,000 gallons is available through the utilization of the entire storage of foam liquid.

Foam coverage from the systems is at a rate of about two inches of depth per minute. This is a more than adequate discharge and will provide for the extinguishment of fire in less than three minutes from the time of origin. Somewhat more than 7½ minutes supply of foam is available from each section of the foam storage tank. In general, with the foam liquid presently available for the systems, the entire area could be covered with two foam blankets of about six inches in depth.

Aside from standard foam nozzles at each portable hose station location, special goose-neck applicators are provided for the extinguishment of any fire which might occur in the vertical storage tanks.

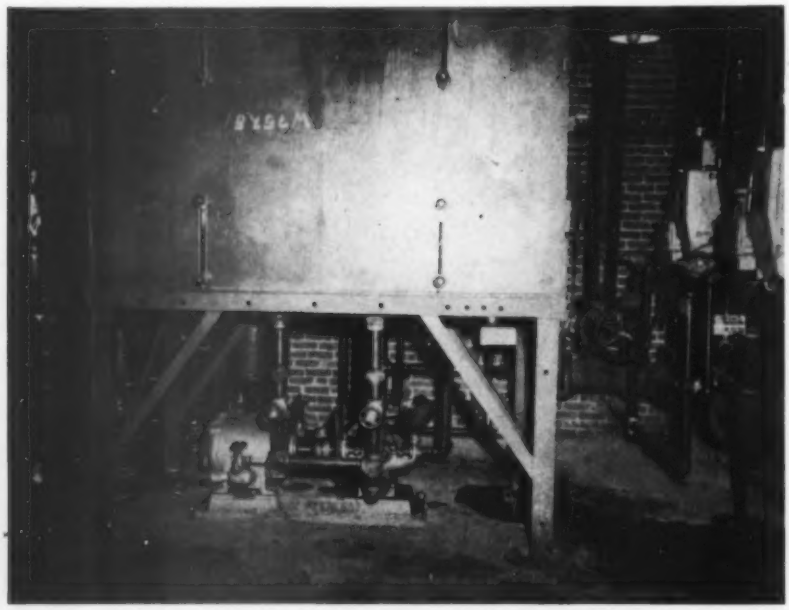
Final acceptance tests of the systems at the Varnish Company plant were conducted by the Factory Insurance Association and other interested parties on October 18 and 19, 1949. Aside from these standard tests, a full scale foam discharge test of System No. 1 and portable hose stations was conducted. These tests proved the engineering design and the mechanical operation of all devices to be satisfactory.

The full scale test of System No. 1 was started by applying a heat testing pan to one of the heat actuated devices. Within 18 seconds, the six inch deluge valve had operated. It immediately started the foam liquid pump and opened its companion valve, thus starting the injection of foam liquid into the system through the orifice injection plate. Within 20 seconds of the operation of the control valve the deflectors of the system were discharging foam at full efficiency. The system was allowed to operate for approximately 3 3/10 minutes and used about 190 gallons of foam liquid during this period. The foam liquid injection rate was between 6 and 6½ percent, giving a 30 percent safety factor above the 5 percent minimum injection rate.

The foam coverage at System No. 1 was excellent and, upon completion of the tests, a foam blanket of approximately seven inches had been laid above the bed of the spur track. Following the completion of these tests, water was discharged from the system on to the foam blanket. No serious dissipation of the foam blanket was apparent. During water operations it was noted that water, properly applied, may be useful in reducing the volume of foam liquid required for the control of fire. An interesting observation at the time of these tests was the fact that the removal of the foam blanket was simple since the foam dehydrated within a few hours and actually dissipated itself.

These tests indicate that systems of this type are now applicable for the protection of entire buildings and areas involving the handling and processing of materials such as hexane, benzol, gasoline and other volatile liquids. When installed, mechanical foam protection reduces the fire hazard to the equivalent of an ordinary sprinklered occupancy. Use of mechanical foam in this manner makes possible engineering economies in fire protection design of water supplies, drainage, etc., and provides for immediate extinguishment of spill fires. This type of system is at present proposed for several major plants which are processing and handling flammable liquids. Estimates of the cost of these systems show that a substantial reduction over other types of proposed fire protection is now possible.

Persons responsible for the design and development of this specialized equipment include H. D. Wright, J. W. McHugh and F. J. Igoe of the Schenectady Varnish Company; J. L. Heather and C. Liddle of Austin and Company, Incorporated, Albany, New York; Wynn Jones, R. L. M. Russell and P. C. Kneil of the Factory Insurance Association; L. W. Boerner of the National Foam Systems Incorporated; C. B. Miller, H. N. Rider, H. P. Kunzelman and E. B. Rumble of the "Automatic" Sprinkler Corporation of America.



Aer-O-Foam Storage Tank and Injection Pump of the Installation at the Schenectady Varnish Co. Plant

Dies Fighting Brush Fire

John Van Der Kloster, Jr., 59, of the Hawthorne, N. J., Fire Department, died while fighting a brush fire at Mohawk Ave. and North Eleventh Street, Hawthorne, on December 29, 1949. The dead man was a long time member of Engine Co. No. 4. He had responded to the fire shortly before 4:00 P.M., and collapsed at 4:01 P.M. while operating with his company at the scene of the blaze.

RICHARD ADELMAN.

Heavy Life Loss Featured 1949 Fires

Despite steady improvement in the nation's fire defenses, the United States suffered a series of serious fires in 1949, with heavy loss of life.

The largest toll of American lives was taken on September 17 when the steamship Noronic burned at its dock in Toronto, Ont. Nearly all the 118 dead were Americans. The hospital fire in Effingham, Ill., on April 5, which resulted in 75 deaths, was second worst in U. S. lives lost. Thirty-two other major blazes, most of which could have been prevented, also caused heavy destruction and many deaths.

"Carelessness was a factor in most of the fires during 1949," according to W. E. Mallalieu, general manager of the National Board of Fire Underwriters. "Neglect of fire protection, poor housekeeping, and lack of employee training in fire safety were the chief factors in making big fires out of otherwise small ones."

A death toll of 19 was reported following an explosion in a meat-packing plant in Sioux City, Iowa, on December 15. The local fire chief said the disaster was probably caused by leaking natural gas.

On August 8, fifteen young "smoke jumpers" parachuted from airplanes to help fight a roaring forest fire in Helena, Mont. The wind switched suddenly, and the youths were trapped by flames. Only three escaped.

A fire in a 122-year-old residence hall at Kenyon College, in Gambier, Ohio, took the lives of nine college students on February 27. Seven persons died in a hotel fire in Aberdeen, Wash., on July 3, and six church-goers were killed when a Marion, S. D., church was shaken by an explosion on April 10.

Sixty-three people died in fires during the Christmas weekend. Many of those fires were caused by flammable decorations and by defective wiring on Christmas trees.

One of these tragic Christmas fires struck the little town of Hyndman, Pa., on Christmas night, and leveled the town's business section. The blaze, said to have started in a Christmas tree, took one life and left 62 homeless.

Total fire deaths in the United States during 1949 exceeded 10,000, the National Board of Fire Underwriters pointed out in urging intensified efforts throughout the nation to save lives during 1950.

Eight Dead in Set San Juan, P. R., Fire

Eight persons were burned to death in an explosion and fire on December 15, 1949, at San Juan, Puerto Rico, which was reported to have been set to collect insurance.

The ground floor of the building on Allen street was occupied by the store "Almucenes Palou" of which Miguel Palou was proprietor. The second and third floors were used as living quarters by two different families, of which only two members survived. The contents of both these floors as well as the store were completely destroyed by the fire.

According to testimony of people in the neighborhood, the fire was preceded by a violent explosion which blew the ground floor doors, with bricks, fixtures and pieces of wood clear across the street into the windows of the stores on the opposite side. This blast also destroyed the stairs, and the ensuing fire quickly enveloped the entire structure.

The fire department, which is under the direction of Raul Gandara, Insular Fire Chief, received its first notification of the trouble at 3:30 A.M. when members of Fire Station 2 at San Juan were told by a man that there was a fire on Allen street. Engine 8, a 500 G.P.M. pumper, was dispatched and the call put through to the central Station at Santurce.

Between 3:30 and 3:45 A.M., several other phone calls were received at headquarters. Three pumpers, an 85-ft. aerial ladder and one ambulance were dispatched by order of Chief Gandara.

Firemen found the three-story brick and frame building in Allen street fully enveloped in flames. Stairways were destroyed and firemen had to resort to the ladders to reach the upper floors. The aerial was located in front of the building and extended to the balconies on the third floor. Three 2½-in lines were operated from this ladder truck.

The fire was attacked from rear as well as front, through the adjoining buildings, eleven 2½-in streams in all being operated on the blazing structure. Fifty-six firemen fought the fire.

As soon as the fire had been knocked down in the front part of the building, firemen entered the structure—a difficult task inasmuch as parts of both floors had collapsed.

Upon reaching the third floor, and about six feet in from the balconies, the bodies of a man and a girl about eight years old were found. As firemen worked further into the structure they found more victims. Three were removed from the third floor, three from the second and two were found in the debris.

With discovery of the first casualties, and with the evidence of the severity of explosion and fire at hand, Chief Gandara instructed firemen not to touch anything, notified the police and the district attorney.

On the 21st of December, Miguel Batalla, brother-in-law of the owner of tne store was arrested. He testified that the fire had been intentional in order to collect a $40,000 insurance policy on the contents. He declared he and Mr. Palou had poured 15 gallons of gasoline around the inside of the store and then thrown a match to ignite the fuel. This was what caused the explosion and started the blaze. The owner of the store, Palou, his brother-in-law, Battala, and Lucas Castro, silent partner in Palou's business, were indicted for eight first degree murders and for arson.

The material losses were estimated at $70,000.

*From a special report to FIRE ENGINEERING from Chief Raul Gandara.

Abbreviated Fire Prevention Code

An abbreviated edition of the National Board of Fire Underwriter's Fire Prevention Code is now available, as a companion document to the abbreviated National Building Code which was issued several months ago.

The 30-page Fire Prevention Code provides for fire prevention and protection in connection with hazardous materials and processes. It was drafted with special consideration for brevity and simplicity.

The two abbreviated Codes are intended for adoption by communities which feel the need for less detailed building and fire prevention codes than those required by larger cities.

Both are consistent with the longer editions of the Codes, but do not cover some hazards or building practices ordinarily found only in larger cities.

(*Continued on page* 146)

Ruins of Building in Which Eight Lives Were Lost at San Juan, Puerto Rico.

Short Cuts and Gadgets

GETTING WATER FROM FROZEN PONDS

In the past, FIRE ENGINEERING has published a number of suggestions for getting water out of frozen ponds or streams for fire fighting purposes.

Now comes a contribution by James H. Fairbrother, Roosevelt, L. I., taken from the New England Homestead of Jan. 14, 1950, which describes the "Ever Ready Hole" or barrel method of obtaining water from frozen ponds, and which we pass along to our readers for what it may be worth.

This procedure provides for pumping water directly from a frozen pond through a hole in the ice made by a barrel partly filled with brine. The method, it is said, was perfected by Dr. Karol J. Kucinski, research agronomist working cooperatively with the Soil Conservation Service.

The equipment used is simple and inexpensive, and it can be installed in a pond of any type.

An oak barrel, such as a cider cask, with one end knocked out, is partially filled with brine. This can be made by dissolving a pailful of rock salt in about one-third barrelful of water. The barrel should be floated near the bank in a deep part of the pond or stream, which can be easily approached by a pumper. A substantial approach such as a plank dock can be made to reach out to the barrel, which is anchored with a small piece of board fastened to the approach (see diagram).

The exact location of the barrel can be marked by nailing an upright stick, preferably painted a bright color, to the side of the barrel and having it extend a few feet in the air. This marker will be readily noticed if snow covers the surface of the site.

In case of fire, firemen need only strike the wooden staves on the outside of the barrel about four times with an axe or maul, the barrel will collapse, leaving a hole in the thick ice through which the suction hose can be dropped into the water (see diagram).

It should of course be emphasized that the success of the entire plan depends upon the ability to get the pumper sufficiently near the barrel to permit effective suction being taken. The dock, or pier, if used, must be strong enough to support the pumping unit.

It is said that during the past two winters, trials were made with the "ever ready hole," and it was found that it took four good blows of an axe on the barrel staves to break up the barrel, taking about 16 seconds time.

* * *

ANOTHER IDEA FOR A HOSE ROLLER

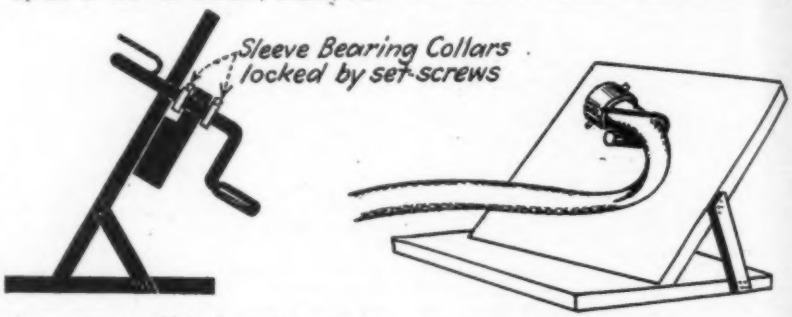
This Journal has received numerous ideas for gadgets for rolling and handling hose, some of which have been published. But the end apparently is not yet. Here's another idea, from A. H. Spratt of the Bar Harbor, Maine, Fire Department, which is worth passing along. Brother Spratt writes:

The enclosed sketch is for a hose roller that can be used either for doughnut or regular rolls. One man can use it very easily and it is simple to construct.

The hose and upright panels are of 2 in. planking, about 2½ ft. wide. The upright panel is swept back about 15 degrees. This inclined back makes the rolls lay on the backboard and roll up evenly. By holding the hose against the board lightly, as the crank is turned, the operator's hand guides the hose.

The crankshaft turns in a sleeve, bolted on the support and end-play of the crankshaft is controlled by two collars which are held by set screws.

The hook is welded to the shaft. The shaft, through the bearings and board, is solid with the crank, which is made of ¾ in. water pipe, threaded on. A handle-bearing sleeve makes the operation more comfortable.



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SCOTCH-LITE TO GUIDE RESCUERS

A recent development in the use of Scotch-lite, the phosphorescent "cold" light described previously in FIRE ENGINEERING for marking fire hydrants, etc., has been suggested by a retired Duluth, Minn., fireman. This is to place special markings in the rooms of handicapped persons to guide rescuers in case of fire.

The Duluth Chamber of Commerce has sought a marker that would be mindful of the rights of individual privacy, which could easily be seen by night, but would be inconspicuous during the daytime.

Scotch-lite was mounted on 4x6 inch panels which were then placed on dwellings and in rooms that house incapacitated persons.

The idea has been given particular consideration in view of the number of serious fires in hospitals, nursing and convalescent homes and other places of public occupancy.

* * *

SUPPORT FOR SUCTIONS

Another idea spotted by our gimlet-eyed reporter at Ottawa during the Dominion Association of Fire Chiefs Convention might be adapted to use elsewhere.

Instead of the customary chafing blocks, wood pieces used to prevent chafing of suction sleeves while in operation on a pumper, the Ottawa Fire Department carries on each pumper a simple wooden gadget consisting of two straight wood members about 3 ft. long, pinned together about one-third the distance from one end so that the two members can be opened up like the ends of a saw horse, viz: "X". When opened out, the shorter end is placed under the suction section as a brace to help keep it off the ground when in operation at a hydrant. In operating from draft, the gadget is particularly useful where the suction must be carried over a fence, railing or parapet. Fire Chief Gray G. Burnett reports that this contrivance, which is easy and inexpensive to make, is used continually by his department.

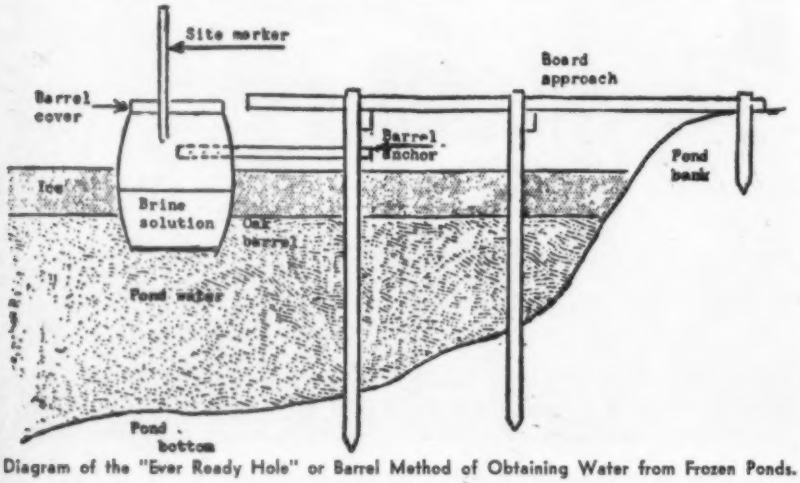

Diagram of the "Ever Ready Hole" or Barrel Method of Obtaining Water from Frozen Ponds.

"ONE WRONG MOVE WOULD HAVE BLOWN US SKY HIGH!"

says **CHIEF EDWARD GALL, Sr.**
Mount Vernon, New York

"10,000 gallons of high octane gasoline had leaked from a nearby storage tank into a street excavation. It had to be pumped out—and we prayed there'd be no sparks . . . one misstep would make a first-class catastrophe.

"The foam generator was immediately hooked up and put into operation. We laid extra foam and hand lines to cover exposures. A blanket of foam was kept over the gasoline while it was being pumped out and repairs were being made to stop the leak. After we were on duty for 48 nerve-wracking hours, the area was declared safe and we were finally able to take a deep breath."

Let's swap Fire Fighting Stories like this one! . . .
What's your favorite? Send it along to us today!

FOR GREATER PROTECTION TO LIFE AND PROPERTY

Hundreds of fire chiefs and thousands of firemen know the dependability of Eureka Fire Hose—dependability that results from these features:

- ★ **The Unique Smooth Interior Filler Ply, for maximum nozzle pressure.**
- ★ **Bomb-Tested Lining, to insure long, dependable life.**
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- ★ **Formula "X" for positive protection against mildew.**

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Please mention FIRE ENGINEERING *when writing advertisers*

Respiratory Equipment

(*Continued from page* 109)

ditions are better than one working alone—and man or men should be provided with the utmost possible illumination. In this detail good masks and good lighting equipment are handmaidens.

There are certain conditions under which a mask wearer cannot operate with a life or signal line attached to him. Some chief officers consider the guide line or life line a positive hindrance, if not hazard to life, when so worn. Others are content to let conditions dictate the use of such equipment. They reason that where a man may have to operate alone and especially if he is not well versed in mask usage, he should have a life line. They believe that where men must move around within the fire building, cross each other's paths and exert themselves physically, such lines can best be omitted. Not a few disagree with the Board's advice that when wearing breathing apparatus men should always use a safety line. Several chiefs point to years of continual use of such protective equipment during which time life lines were not employed, without any unfavorable effects to men or apparatus.

Signal on line	Given by wearer	Given by attendant
1 Pull	I am all right.	Are you all right?
2 Pulls	Pay out more line.	I am paying out more line.
2 Pulls—pause—2 pulls	Stop lowering.	I am stopping lowering.
3 Pulls	Haul in slack line, or haul up.	I am hauling in slack line, or I am hauling up.
Repeated, sharp pulls	Danger—help me out.	Danger—come out at once.

In a number of air crash fire fighting crews, the harness worn by personnel has a ring firmly fastened to the back of the harness to which a light steel cable can be firmly secured. The idea is that should the emergency arise, the wearer can be pulled to safety, even through a fire if necessary. This fastening does not interfere with the face or lung protective devices normally worn by crash fire fighters. Certain fire chiefs have raised the question why a somewhat similar arrangement could not be made a part of the municipal fireman's respiratory protective equipment.

In this connection a word about the British custom may be interesting. They have, on occasion, used what they term a "bobbin line." This is a light line, fastened to the mask wearer and trailed behind him. The purpose is not for signaling or to enable him to be drawn to the outside air, but to permit him to retrace his steps if necessary, much on the order of the fireman who follow back a line of hose.

No standard system of life line signals is understood to have been adopted by fire fighters and rescue forces in this country. The above signals which are in effect in the British fire service, are used in whole, or in part in many parts of this country.

It is recommended that where signals are employed they should be acknowledged by the recipient of the order, repeating the signal to show that it has been understood and is being acted upon. Failure to receive an acknowledgment from the head of the line (wearer of mask) should be cause for immediate investigation at that end.

Summing Up

Introduction into our daily life of products and processes involving chemicals has created vast hazards to life and property, thus increasing the problem of fire control.

The most serious obstacles to rapid, effective attack and rescue on fire are smoke and gases, particularly those which are toxic in nature, or accompanied by oxygen deficiency.

Only by employment of proper respiratory protective equipment of approved and reputable makes can these obstacles be overcome.

Such equipment, however, must be available when needed—in the amount required for the purpose. First-due fire fighting apparatus, as well as rescue, emergency and medical units, must be adequately equipped with such life-saving facilities. The practice of having "special call" units equipped with these facilities, with resultant dangerous delay, is now considered outmoded.

Respiratory protective equipment should be as much a part of the modern fireman's working life as his bunker clothes.

Such equipment speeds attack, and fire control (as well as rescue) by facilitating size-up; locating the heart of the fire; exits and entrances for attack

(*Continued on page* 149)

Do You Need an

EMERGENCY FLOODLIGHT TRUCK?

DeLuxe CUSTOM BUILT EQUIPMENT with or without the FLOODLIGHTING FEATURE, All Steel Enclosed

TWO - MODELS

THE SENIOR (3 ton Chassis, 175" Wheel Base)

THE STANDARD (2 ton Chassis, 158" Wheel Base)

Both Models carry complete First Aid and Salvage Equipment as required by the customer.

The SENIOR MODEL—most suitable for cities, is equipped with exterior and interior compartments and seats for the crew. Five built for the City of New York; one with portable floodlighting equipment and four with 10KW power take off driven generator and elevator controlled floodlights. Three built for the City of Philadelphia, with 10KW elevator controlled floodlights.

The STANDARD MODEL—for the average Fire Department, with or without elevator floodlights, equipped with exterior compartments, and the interior equipped with mounted stretchers and seats for the crew. This model in service in many Fire Departments for over 10 years.

Write for detailed construction and electrical specifications, photographs and prices and state your requirements.

Some territory open for agents

Builders of Fire Department Pumpers and Airport Crash Trucks

AFE **APPROVED FIRE EQUIPMENT CO.**

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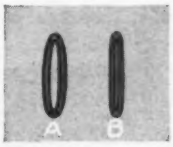
BLACKINTON'S NEW AERO BAND



Thinner and Flatter

Clings Together

Flexible

Smokey has his eye on that New Blackinton AERO BAND. It's really something to shout about — with features never known before in cap strap construction.

It's Thinner and Flatter: Ordinary flexible cap straps (A) have that old belly bulge. The new AERO BAND (B) is thin and sleek looking.

It Clings Together: AERO BAND is constructed to cling to a cap. It snuggles close to the cap and then stays there.

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Ask your dealer to show you one . . . you'll be convinced that AERO BAND is the Strap for Your Cap.

Uniform houses, suppliers, etc. — let us show you the advantages of handling Blackinton badges and uniform equipment. Write for information today.

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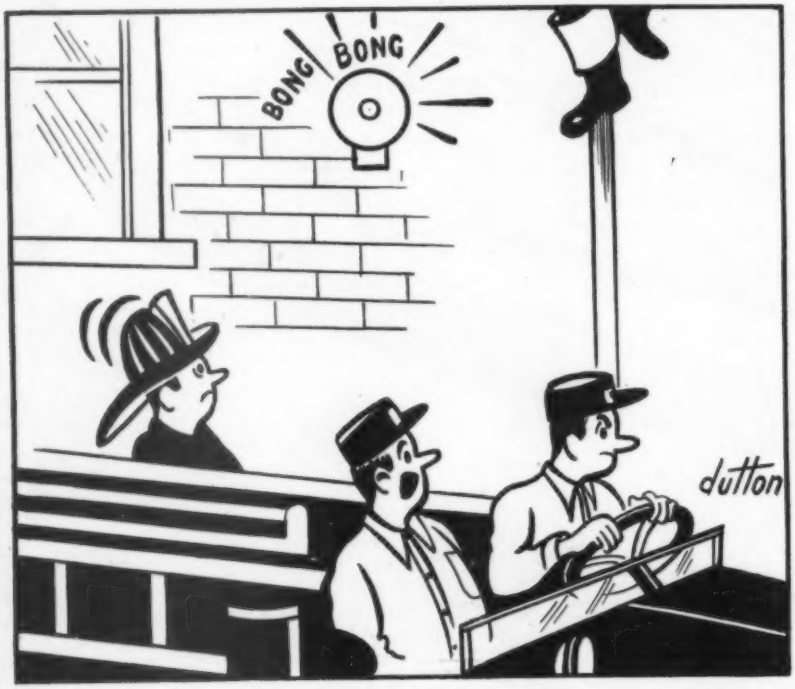
FALSE ALARMS



"Always the Last One Down. He Insists on Closing the Windows in Case of Rain!"

Framing the Judge

Judge: "How does your wife irritate you?"

Husband: "Why, she keeps saying: 'Hit me! Go on hit me, and I'll have you hauled up before that baldheaded old reprobate judge and see what he'll do with you'!"

Judge: "Prisoner discharged."

"As I understand the case," said the judge, "you and your husband had a drunken altercation and you were kicked in the ensuing rumpus."

"No, suh, jedge," replied Mandy, "Ah was kicked in de stummick."

Mother: "Do you like your new governess, Willie?"

Willie: "No, Mom, I hate her. I'd like to grab her and bite her neck like daddy does."

And then there was the man who walked into the bar optimistically and walked out mistyoptically.

A good way to keep healthy: Wash your face in the morning and neck at night.

Johnny had just bought a popsickle when the school bell rang. Stuffing it hurriedly into his pocket, he marched into the classroom. In a few minutes the teacher called on him to answer some questions. "Johnny," she asked, "what are the people in China called?" "Chinese," answered Johnny. "And Japan?" asked the teacher, "Japanese," replied our little hero. "Now for the last one—what are the people in Europe called?" This stumped Johnny. He stammered and mumbled, until his neighbor whispered, "European." Johnny flared. "I ain't neither—it's that darn popsickle!"

Voice from passing car: "Engine trouble?"

Voice from parked car: "Nope,"

Voice from passing car: "Tire down?"

Voice from parked car: "Didn't have to."

Lives of great men all remind us,
As their pages o'er we turn,
That we're apt to leave behind us
Letters that we ought to burn.

"What's in the Ming vase on the mantle?"

"My husband's ashes."

"Oh, I'm sorry. How long has he been dead?"

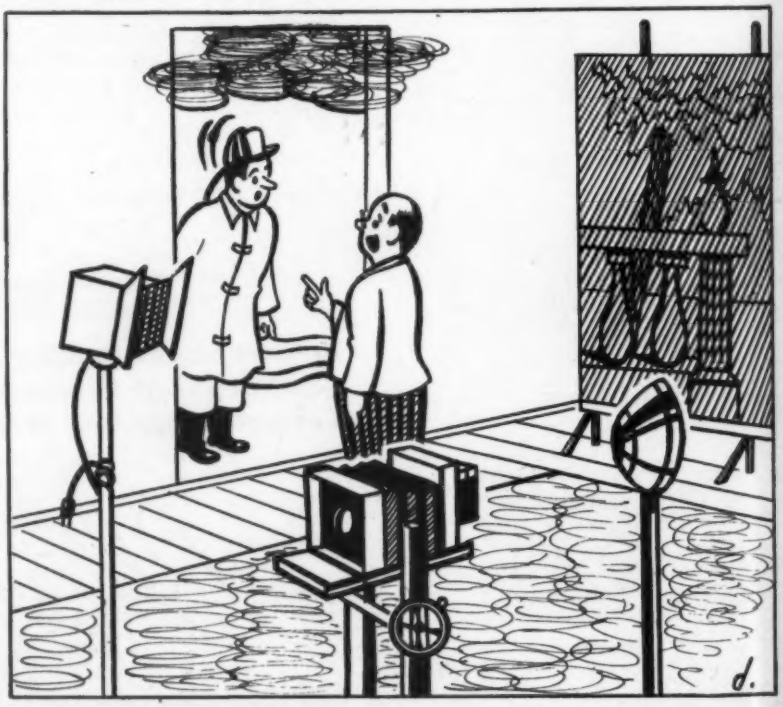
"He's not. Just too lazy to find an ash tray."

A gambler died. The funeral was well attended by his professional friends. In the eulogy, the minister asserted: "Spike is not dead. He only sleeps."

From the rear of the chapel came the interrupting words: "I got $100 says he's dead!"

"Well, my boy," said the new minister to the three-year old. "What did you get for your birthday?"

"Aw, I got a little red chair," said the kid, "but it ain't much good. It's got a hole in the bottom of it."



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Your Best Protection

FOR FLAMMABLE LIQUID, GAS AND ELECTRICAL FIRES

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BENZENE • ALCOHOL • LACQUER
VARNISH • SOLVENTS • PAINTS, ETC.

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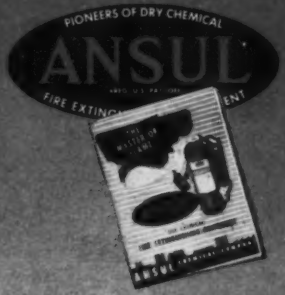
FIRE EXTINGUISHERS

They're most dependable too! Years of field service on all kinds of industrial applications has resulted in outstanding design features available ONLY in Ansul Dry Chemical Extinguishers.

FIRE PROTECTION by the dry chemical method has proved *Most Effective* as well as *Most Economical*. And only Ansul offers a complete line of hand, wheeled and stationary dry chemical fire extinguishers. Investigate Ansul Piped Systems for protection of special hazards.

Send for File No. 514. You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped Systems and Ansul 2000 lb. Stationary Units.



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1. Quick, Positive Extinguishing Action.
2. Easier on the Spot Recharge (No special tools needed).
3. No Annual Recharge Necessary.
4. Low Maintenance Costs.
5. ANSUL PLUS-FIFTY Dry Chemical used Exclusively.
6. Long Range Stream.
7. Effective in Winds and Drafts.
8. Stream pattern forms heat shielding screen to protect operator.
9. Listed and Approved by Underwriters' Laboratories, Inc., and Factory Mutual Laboratories.

ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN
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World Wide Fire News

By Roi B. Woolley

Heavy Life Loss in Uranium Mine Fire

Although contradicted by Soviet news agencies, German and British news sources reported that between 2,000 and 3,700 persons died in a uranium mine fire in the Soviet occupation zone late in November. Reports claimed it was one of the worst mine disasters in history and charged that it was due to negligence. Reports blamed the fire on a short circuit in cables.

The mine is in the Erz mountains on the Saxony-Czechoslovak border, near Johannesgeorgenstadt. The bulk of the workers in the mine, it was reported, were political prisoners.

The fire caught half the full working force of about 5,000 on the job at the time, and most of them perished from suffocation and burns. The fire spread rapidly to nearby mine workings and detonated an explosives dump, wrecking a mine hoisting tower.

Rescue teams were called from all nearby cities in Saxony although it is said rescue efforts did not begin for twelve hours after the tragedy.

It is doubtful that the full facts of the disaster will ever be known because of the strict censorship clamped on by the Soviet.

* * *

Fire Razes Kowloon—20,000 Chinese Homeless

Wholesale destruction continues to devastate China. The worst conflagration in Kowloon's colony history swept through thousands of makeshift shacks near Kaitak airport, Jan. 11, 1950, leaving an estimated 20,000 Chinese homeless and penniless.

The flames engulfed Kowloon's old walled city, destroyed the ancient Buddhist temple, a score of small factories and half a dozen large wooden and concrete structures.

Firemen did not estimate the number of deaths or the monetary loss.

* * *

Many Flee Boston Ship Fire

Forty crewmen and two stewardesses escaped in their night clothing, most of them by squirming their way out of portholes, from a fire and explosion that wrecked the midship section of the Norwegian freighter Fern Bay, moored at the Army Base in Boston harbor, on Dec. 23, 1949. Two crewmen suffered burns. The loss was estimated at "between $100,000 and $500,000."

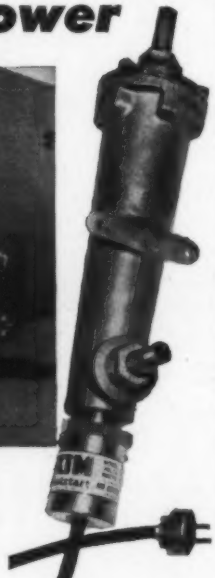
The 8,000-ton ship, only 10 months old, out of Oslo, reached Boston from Port Said with a cargo of rubber and tea. What caused the fire is not reported, but it had good headway upon discovery. Boston Fire Department, marine and land forces, aided by Army Base fire fighters fought the fire and were successful in preventing its extension to the Army Base sheds.

* * *

Hot Off the News Ticker

A large natural gas pipe line to the Oak Ridge atomic plants exploded in December near Carthage, Tenn., shooting flames 1,000 feet into the air. It set fire to a farmhouse, burned two women, knocked children to the ground and peppered countryside with flying rocks. . . . Fire destroyed two Army buildings of First Army's marine repair unit at Fort Adams, Newport, R. I., early Jan. 12, 1950, with loss of $100,000. . . . Near Maceio, Brazil, a freight train was derailed and wrecked tank cars spewed gasoline. A rubbernecker lit candles to survey the scene. The resultant explosion burned many houses to the ground. . . . When a light plane crashed into cotton bales at the Lubbock municipal airport, Lubbock, Texas, on Jan. 2, 1950, two men were killed. Fire followed the crash, burning 25 bales of cotton. . . . A British Overseas Boeing Stratocruiser landed safely at International Airport, New York, with one of its four engines out of commission after four hours of flight on three engines. Fire fighting equipment stood by for the landing. . . . Four persons were killed and five injured shortly after Christmas, in the Soviet area of Berlin when fireworks touched off a fire in a department store of the Soviet's Consumer Association. . . . The J. T. Baker Chemical Company of Phillipsburg, N. J., was indicted Jan. 9, 1950, on a Federal charge of violating Interstate Commerce Commission safety regulations in the Holland Tunnell explosion of May 13 last. The company pleaded innocent. An explosion and fire in a truckload of the firm's chemical drums nearly caused a serious disaster. It is claimed that 55 gallons of carbon bisulphide had been placed in drums which, because of thickness of the steel in the drums, were limited by the ICC to five gallons each. The truck was carrying 80 of the drums. . . . Governor Thomas E. Dewey was driven from his office in Albany by fumes from a minor fire in a heat-con-

Full Starting Horsepower



...FOR FIRE TRUCKS AND EMERGENCY VEHICLES

Full driving power at the touch of the starter button is provided by the KIM Hotstart.

This engine pre-heater, connected to the electric circuit, circulates warm water through the engine, keeps it ready for instant starting, eliminates loggy, uncertain operation of a cold engine. It disconnects in an instant and does not interfere with regular circulatory system. Here are other results of the KIM Hotstart:

Reduces engine wear and depreciation

Saves batteries

Cuts fuel consumption

A KIM Hotstart can quickly be installed on your fire truck. To learn more about how it will improve the efficiency of your department, see your International Harvester or Mack Truck dealer or automotive supplier; or send the coupon for illustrated literature.

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West 917 Broadway, Spokane 11, Wash.

Please send literature, prices and name of local dealer.

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City_____

Zone_____ State_____

trol unit. He discovered the fire, and moved to other quarters, but kept on working while the firemen controlled the small blaze. . . . In Toronto, Ont., Allan Cairns dived head first into a snow bank to extinguish his hair which caught fire while he was pouring gasoline into his car from a can. The quick "shampoo" probably saved his life. . . . A London, Eng., fire protection survey blames nightgowns for the deaths of 265 children in the 12 months period ending last October. Pajamas are advised in preference to 'nighties'.

What's Burning

THE following list includes fires of $10,000 loss and over in the United States and Canada for the month of January, 1950.

Month Ending January 31, 1950

Dawson City, Y. T.—St. Mary's Hospital destroyed.
Grimshaw, Alta.—One side business street destroyed.
Anaheim, Cal.—The Granada packing house damaged.
Churdan, Ia.—Hadden Motor Co. destroyed.
Frederick, Mich.—Ausable Souvenir Works destroyed.
Mt. Pleasant, Mich.—Morris 5 and 10-cent store, Economy store, Dittman's Shoe Store, Shepard's jewelry and Folan's Optical shop, damaged.
Apollo, Pa.—Dwelling, business district, destroyed.
Salt Lake City, Utah—Western Service Concessionaire Co. damaged.
Amherst, N. S.—Clothing store of Samuel Abrams destroyed.
Danville, Que.—Apt. house, dry goods store, restaurant, barber shop and pool hall, destroyed.
Beverly Hills, Cal.—Residence of Guy A. McAfee, destroyed.
Fullerton, Cal.—W. A. Snyder & Sons' citrus packing house, adj. citrus reaming equip. bldg., destroyed; dwelling, three garages, roof of California Fruit Distributors' packing house, damaged.
Chicago, Ill.—Builders Furniture & Carpet Co. damaged.
Detroit, Mich.—Storage shed at the big Dodge main plt. of Chrysler Corp. damaged. Exploding oil drum.
North Platte, Neb.—Whse. and shop of farm service company, along with a stock of new combines, trucks, equip. and machinery, destroyed.
Eugene, Ore.—Irish & Swartz Market destroyed.
Enterprise, Ore.—Dutli cold storage, Rich shoe shop, Harman & Dodgen Hardware, damaged. Explosion ammonia tank.
Norfolk, Va.—Empire Machinery & Supply Corp., destroyed. Adj. bldg. of C. E. Thurston & Sons, Inc., damaged.
East Sound Orcas Island, Wash.—Odd Fellows Temple, East Sound Theatre, destroyed. Fuel tank explosion.
Anaheim, Cal.—Granada Packing House destroyed. West Coast Screen Co., lumber yard, destroyed. 100,000,000 board feet of lumber burned. Two boys admitted starting the fire.
Buena Vista, Cala.—Part of the big State reformatory bldg. destroyed.
Chicago, Ill.—Three large business bldgs. damaged.
Sioux City, Ia.—Bldg. of Concrete Pipe & Machinery Co. destroyed.
Mexico, Mo.—Main plt. of Mexico Refractories Co., damaged.
Glen Cove, L. I.—Mansion of Mr. Howard W. Maxwell, Red Spring Lane, damaged.
Ogdensburg, N. Y.—The John Downey grocery store, The C. A. Bellinger meat market, a Grand Union store, a second-hand store and two apts., destroyed.
East St. Louis, Mo.—Adams hotel, with clothing and jewelry store, damaged.
Cottonwood, Ida.—Cottonwood Hardware Co., damaged.
Chillicothe, Mo.—Cooke Sales and Service Co., damaged.
Reno, Nev.—French hotel damaged.
Minot, N. D.—Occident elevator and adj. office, damaged.
Wyndmere, N. D.—R. A. Dotzenrod and Son implement bldg. destroyed.
Lake City, S. D.—Four business bldgs., occupied by grocery store, dance hall, beer parlor and recreation parlor, damaged.
Chicago, Ill.—Chicago Furniture whse. damaged.
Davenport, Ia.—Mercy Hospital, mental ward, destroyed.
Madisonville, Ky.—Bldg., Morton's Gap, occu-

HALE Type FZZ Portable Pumping Unit
Handy For Re-Laying To Major Pumper

- **Compact yet powerful:**
- **Designed for Fire Fighting**

Today! Write →

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HALE FIRE PUMP COMPANY
Conshohocken, Pa.

Gentlemen:

☐ Please send us detailed information on the HALE Type FZZ Portable Pumping Unit.

☐ We are interested in a demonstration. (No obligation.)

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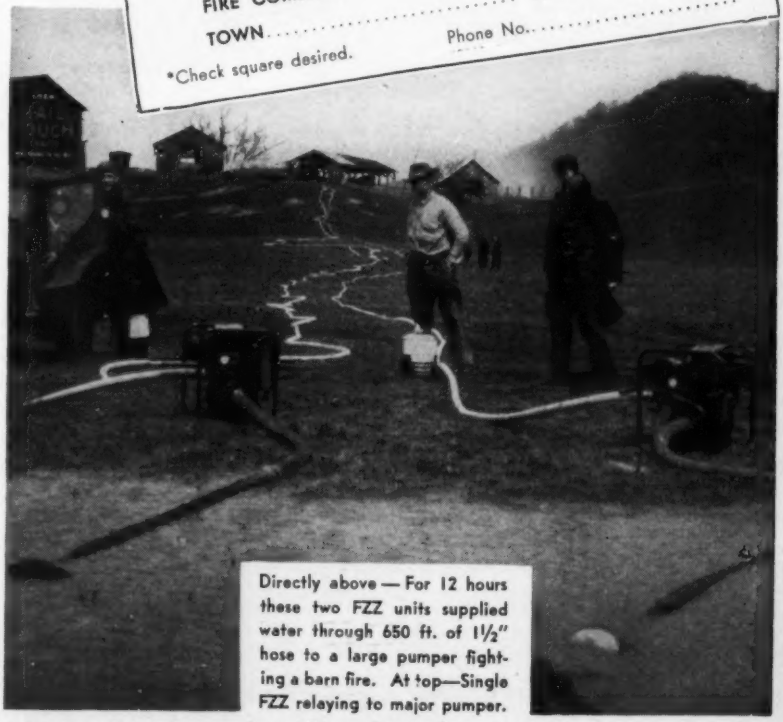
FIRE COMPANY ..... STATE .....

TOWN ..... Phone No. .....

*Check square desired.



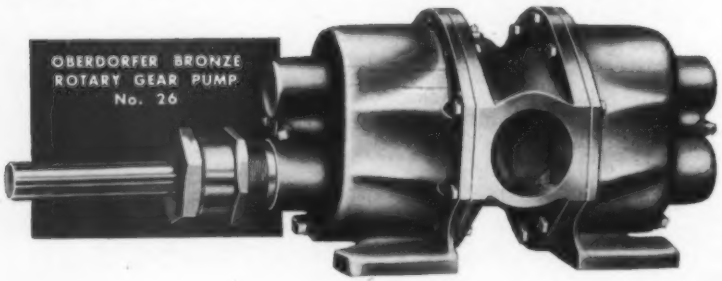
Directly above — For 12 hours these two FZZ units supplied water through 650 ft. of 1½" hose to a large pumper fighting a barn fire. At top—Single FZZ relaying to major pumper.

pied by Harrison genl. store and offices of Bell & Zoller Coal Co., destroyed. Bldg. occupied by James Lovan grocery store and Odd Fellows hall, damaged.
Morganfield, Ky.—Morganfield Stockyards destroyed.
Grand Rapids, Mich.—Blackberry school destroyed.
Kalispell, Mont.—Elrod School destroyed.
Geneva, N. Y.—Business bldg. and apt. damaged.
Schenectady, N. Y.—The Town Tavern destroyed.
Jersey City, N. J.—Jersey City Stationers store damaged.
Dayton, Ohio—Bldg. 28 E. Third St. damaged Main floor occupied by Virginia cafeteria.
Flandreau, S. D.—Council Oak grocery store, liquor store, damaged.
Winnipeg, Man.—Don Carlos Casino destroyed.
Carson City, Nev.—Hunter's Restaurant Lodge and two structures damaged.
Bridgewater, Nova Scotia—Three business bldgs. in business district, damaged.
North Vancouver, B. C.—Main mill of Lions Gate Lumber Co., destroyed.
Kelowna, B. C.—Rutland Packing plt. destroyed.
Ruby, Alaska—Ruby Machine shop, Standard Oil whse., damaged.
Indianapolis, Ind.—General Hospital, damaged.
Bardstown, Ky.—Three firms and four apts. damaged.
Battle Creek, Mich.—Three connecting barns on farm of Hector Mestdagh, damaged.
East Grand Forks, Minn.—States Theatre and Ballroom and four business places, destroyed.
Newport, R. I.—Army's marine repair unit destroyed.
Aberdeen, S. D.—Large feed and grain mill of the Riebe & Riebe Grain Co., destroyed. 46,000 bushels, mostly wheat and flax destroyed.
Seattle, Wash.—St. Edwards Seminary destroyed.
Seattle, Wash.—Falcon Nest Lodge contents destroyed.
Waterville, Wash.—Grange Supply Co. plt. destroyed. Explosion.
Wenatchee, Wash.—S & S Automobile showroom garage damaged.
Rutland, B. C.—Kelowana growers' exchange destroyed.
Drummondville, Que.—The dyehouse of Canadian Celanese, Ltd., damaged. 5,000 yards of fabric burned. Machine explosion.
Quincy, Ill.—Whse. of Tony Vidas Transfer and Storage Co., damaged.
Beardstown, Ill.—Two-story brick bldg. occupied by F. W. Woolworth and A. & P. grocery, contents destroyed.
Jersey City, N. J.—Jersey Central Railroad damaged.
Aberdeen, S. D.—Riebe and Riebe Grain Co., damaged.
Sioux Falls, S. D.—Hardware store of William Cowman, damaged.
Gore, Va.—The Shenandoah Silica Co. plt. destroyed.
Vashon Island, Wash.—Summer beach home of Auston Case, destroyed.
Danbury, Ia.—Barry Motor Co., repair firm, damaged.
Ft. Scott, Kans.—Ft. Scott Packing Co. plt. destroyed.
Butte, Mont.—Winter Garden bowling alleys damaged. Defective wiring.
Atlantic City, N. J.—Block of stores on Atlantic City Boardwalk, damaged.
Canton, Ohio—General Plating Co., damaged.
Cincinnati, Ohio—Cordes Lumber Co., damaged.
Wakita, Okla.—Adams Hards-Facing Co. office and forging shop damaged. Oil explosion.
Wister, Okla.—Wister high school destroyed.
Northampton, Pa.—Northampton Lumber Co. main whse. and office bldg. destroyed. Paint shop also damaged.
San Antonio, Tex.—Olmos Dinner Club destroyed.
San Antonio, Tex.—Union Feed Co. damaged.
Charleston, W. Va.—Nu-Tread Tire Co., Inc., recapping plt., destroyed.
Edson, Alta.—Imperial Hotel destroyed. Overheated chimney.
Pictou, Ont.—Royal Canadian School of Artillery destroyed.
Fort Wayne, Ind.—Hangar at Baer Field, nine planes, at Fort Wayne's air natl. guard unit, damaged.
Minneapolis, Minn.—Whse. and salesroom of Minnesota Toro, Inc., distributors of mowing machines, damaged.
Springfield, Mo.—Business block, occupied by farm implement bldg., oil company whse., gasoline station, destroyed.
Clyde, N. Y.—Clyde Cold Storage and G. L. F. Farm Products, Inc., damaged.
Kinston, N. C.—The Ten County Grain Co. plt. destroyed.
Campbellton, N. B.—Whse., office and sheds of Imperial Oil Co., destroyed.
Bridgewater, N. S.—Three bldgs. destroyed.
Carleton Place, Ont.—Zion United Church destroyed.
Indianapolis, Ind.—Allied Truck Equip. Co. and vacant bldg. to the north, destroyed.
Homer, Mich.—Two barns, cattle shed and tool shed on farm of Nector Mestdagh, one mile south, Highway M-99, destroyed.
University City, Mo.—Assembly plt. of Automatic Firing Corp., heating equip. mfrs., damaged.
Burlington, N. C.—Main whse. of S. Levine, junk dealer, damaged.
Edmonton, Alta.—Half of business section and part of main street, damaged.
Norwalk, Conn.—Slock Process Co. plt. damaged.
East Grand Forks, Minn.—Four business and apt. bldgs. damaged.
Birmingham, Ala.—The Todd Co., mfrs. of bank checks and pay roll systems, damaged.
Oakland, Cal.—Dwelling of James Lewis damaged.
Bardstown, Ky.—Three business and four apts., damaged.
Cleveland, Miss.—Cleveland Negro school destroyed.
Johnstown, Pa.—Main hangar and 16 airplanes at Municipal Airport destroyed. Defective wiring.
Kaslo, B. C.—Grayling General Store damaged. Arcade Bldg., George Davis shoe and hardware store, Odd Fellows Hall, damaged.
Dorchester, N. B.—Canadian National Railway freight yards, destroyed.
Little Rock, Ark.—Arkansas National Guard Armory, Camp Robinson, six miles north, destroyed, including radio equip.
New Plymouth, Ida.—Business bldg. damaged.
Chicago, Ill.—Hutchins Lumber and Storage Co. plt. damaged.
Chicago, Ill.—Dixmoor Lumber Co. destroyed.
Johnson City, Tenn.—R. & L. Bowling Lanes damaged.
Yakima, Wash.—Schwarder genl. store destroyed. Explosion.
Springhill, N. S.—Garage and confectionery store, destroyed.
Espanola, Ont.—Avenue Hotel damaged.
Marion, Ia.—Linn County Produce Plant destroyed.
Indian Head, Md.—Glymount Theatre destroyed.
Lake Ozark, Mo.—Arrowhead Lodge, resort hotel, destroyed.
Paterson, N. J.—"Elpoa," mammoth club-house, top of Ramapo Mountains, between Erskine, Cupsaw and Upper Lakes, destroyed.
Stewartsville, N. J.—United Can Co. plt. destroyed.
Boone, N. C.—Appalachian Theatre destroyed.
Spray, N. C.—W. N. Cook Grocery and Spray Hardware Co. destroyed. Oil stove explosion.
Silver City, N. D.—Dakota club, night spot, Garrison Dam, destroyed. Short Circuit.
Columbus, Ohio—Plt. of Allen Mfg. Co., plastic mfrs., destroyed. Spark from welder's torch.
Easton, Pa.—Masonic Bldg. also occupied by Hockman Furniture Co., damaged.

YOU CAN TERMINATE OVER 50% OF ALL FIRE CALLS USING ONLY

OBERDORFER

Booster Pumps



The records of many departments show over half of all calls satisfactorily terminated by Oberdorfer Bronze Rotary Gear Booster Pumps alone, with little or no fire or water loss. These pumps held many more of those calls in control the few minutes until heavy pumpers went into action. They provide water and pressure just as fast as a fireman can get to a fire.

For all their usefulness, Oberdorfer Booster Pumps are surprisingly inexpensive, from $55.00 for a 50 G.P.M. size to $172.50 for the 150 G.P.M. size illustrated.* We have been making bronze gear pumps since 1896, and their quality is attested by the hundreds of departments that have used them for years.

*Slightly higher west of the Rockies.

PERFORMANCE DATA — No. 26 PUMP SHOWN ABOVE

Pump Shaft RPM	Pounds Pressure	Hose Length and Size	Dry Suction Lift in Feet	Vol. in Gal. Per Minute
1600	120	500'-1½"	15'	150

For complete specifications of this and other Oberdorfer Booster Pumps, and name of your distributor, write:

FIRE PUMP DIV., OBERDORFER FOUNDRIES, INC., Syracuse, N. Y.

It will help if you mention FIRE ENGINEERING *when writing advertisers*

Timer Lake, S. D.—Parochial school destroyed.
Iron Mountain, Wis.—First Covenant Church destroyed. Overheated furnace.
Belvedere, Cal.—Apt. bldg., Corinthian Island, damaged. Overheated furnace.
Batavia, N. Y.—Huge dairy barn and milk house on farm of Charles J. Buckenmeyer, destroyed. Spontaneous ignition.
Dayton, Wash.—C. E. Suffield & Son Furniture Store, destroyed.
Lake Trout, Que.—Normandy Lodge destroyed. Furnace explosion.
Thornhill, Ont.—Thornhill Hotel, Harley's Drug store, Answell Appliance Ltd., Findlay's barber shop and Petrolane Corp., destroyed.
Little Rock, Ark.—Luxor Apts., destroyed. Fire in an incinerator.
Columbus, Kans.—Union Grain elevator destroyed.
Portland, Ore.—Mann's Grocery & Market destroyed. Explosion.
Kennewick, Wash.—Art's Food Market destroyed. Short circuit in refrigerator.
Seattle, Wash.—Epperson & Sons, processing plt. destroyed. Shaffer Bros. feed store destroyed.
Ottawa, Ont.—Canadian Tire Corp., the United Refrigeration Sales & Service, the Colonial Art Glass Co. damaged. Defective wiring.
St. John, B. C.—McLaughlin Bldg., occupied by Climo's photography studios, International Correspondence School office, Gray's Beauty Parlor, Higgins Refrigeration Service, St. John Merchants Association, Doig's Printer Shop and Mrs. Jean Cregg, interior decorator, destroyed.
Huntington Park, Cal.—J. C. Penny Co. destroyed.
Colorado Springs, Colo.—Ninety-two bldgs. at Camp Carson destroyed.
Louisville, Ky.—Maslow Cooperage Corp. machine shop damaged.
Onancock, Va.—Plt. and equip. of Eastern Shore News destroyed.
Green Bay, Wis.—Palatial Rockwood Lodge of Green Bay Packers destroyed.
Ottawa, Ont.—Two dwelling huts at Uplands Emergency Shelter destroyed.
Camp Robinson, Ark.—Armory bldg. destroyed.
Albia, Ia.—Imperial Tavern and pool hall and apts. damaged.
Boston, Mass.—Apt. block, 1291 Commonwealth Av., Allston section, damaged.
Toledo, Ohio—Wheeling & Lake Erie R. R. bridge over Naumee River, damaged.
Renovo, Pa.—Ice House of Renovo Ice Co. destroyed.
Lexington, Tenn.—Union Cross Henderson County Elementary School destroyed.
Mosee Lake, Wash.—Whse. of Basin Produce Co. destroyed. Heat unit exploded.

Obituaries

Former Chief Donovan Dead

Former Chief George H. Donovan of Urbana, Ohio, died January 1, 1050, in Cincinnati after a long illness. He had served almost 60 years in fire prevention and protection. His father, before him—Assistant Chief J. C. Donovan, served 42 years in the Cincinnati Fire Department. His son, Larry F. Donovan, is Fire Chief of the U.S.A.F. Lockbourne Army Air Base, Columbus.

George Donovan became a substitute fireman in the Cincinnati Fire Department in 1889, a regular in 1891. He was made lieutenant in 1903 and captain two years later, being promoted to acting marshal in 1915. He retired from the department in 1917 to become Chief of the U. S. Air Nitrate Plant Brigade at Ancor, O. After World War I he was made Chief of the Urbana Fire Department where he materially reduced fire losses and built up the department. He held the post until 1942, when he gave up active service but, through his son and firemen friends, kept close contact with what was going on.

Chief Donovan had a brother, Joseph, who also served the Cincinnati department for 39 years. Larry, the surviving son, has been at it for 31 years.

Funeral services were held in St. Agnes Church, Bond Hill, Cincinnati, on January 5th.

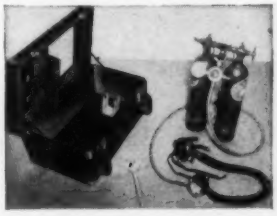
Protect Your Citizens with Better-Equipped Rescue Squads

Scott Demand Inhalator

THE new Scott *Demand* Inhalator provides efficient portable oxygen equipment for emergency use, *at low cost.* Offering "demand" flow of oxygen, plus constant flow if needed, the Scott *Demand* Inhalator can be used independently or as supplemental equipment in resuscitation, freeing resuscitators for use elsewhere.

The Scott *Demand* Inhalator is simply designed, easy to use. No adjustments of any kind are needed; department personnel does not require special training to use this new Scott product.

TYPE "A" Scott Demand Inhalator — portable, or for fixed installation in truck or ambulance (without cylinder) **$88.50**



TYPE "B" Scott Demand Inhalator including carrying case (without cylinder) **$147.50**

Here are the Outstanding Features of the New Scott DEMAND Inhalator

SIMPLE. The Scott *Demand* Inhalator is easy to use — requires no special training. No adjustments are necessary — just a quarter turn of the cylinder valve and the Inhalator is ready to restore shock, immersion and heart-ailment victims.

EFFICIENT. With the Scott Inhalator oxygen is provided in ample quantity as "demanded" by the victim, conserving precious oxygen supplies. Constant flow also available when needed, "at the touch of a button."

LOW COST. In any one of several models the Scott *Demand* Inhalator is available at a cost well below that of other equipment of comparable scope. Investigate this new low-cost oxygen unit *now!*

Made by the manufacturers of famous Scott Air-Pak Safety Breathing Equipment.

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SCOTT AVIATION CORPORATION
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Chief Dahill Dies at 87

A grand old man of the nation's fire service, former New Bedford, Mass., Fire Chief Edward F. Dahill, died Jan. 6, 1950, at the age of 87 in his room in our Lady's Haven, a rest home of Fairhaven, Mass., where he had been confined a patient since July, 1946.

Chief Dahill's 43-year uninterrupted tenure as head of the New Bedford Fire Department is a mark that may never be equalled, due to currently effective retirement laws throughout the nation. During his active life he became known as one of the most progressive chiefs in the service. He was retired in 1947 when the Massachusetts state retirement law became effective.

Chief Dahill assumed head of the fire department in 1904. He joined the department in 1888 and served as first assistant of Ladder 2. In 1896 he was elected to the Board of Engineers, an office he held throughout his career. In 1900 he was chosen first assistant chief of the department and four years later was named chief. Prior to becoming a fireman he had worked in an iron foundry and in the grocery business. He was rated as a boxer and a crack shot in his early days.

Among the revolutionary changes in the department under his administration was the shift from call to permanent men; substitution of motor-driven apparatus for horses; addition of a drill school and improved training methods, and inauguration of advanced fire control techniques. The three-platoon system also was inaugurated before he retired.

The department under his direction, in 1925 built the first pieces of foam apparatus in New England. He also designed an aerial ladder hoist which was known throughout the country as the Dahill hoist. He designed the first piece of automobile fire apparatus used in his city. It was a hose and chemical truck, delivered in 1908.

Edward F. Dahill

His leadership and aggressiveness were widely recognized by his selection for offices in fire service organizations. He served as president of the State Firemen's Association and in 1942 he was named by Governor Saltonstall to a Board of Fire Mobilization Co-ordinators to coordinate the use of fire fighting forces in time of emergency. During World War I the Chief rejected an offer to take charge of fire prevention work in shipyards along the New England coast.

As a final tribute to Chief Dahill, leading representatives of the City of New Bedford and surrounding towns joined with prominent fire officials at funeral services in Holy Name Church, New Bedford, on January 9th.

Charles H. Fox Dead

Charles H. Fox, former president of the Ahrens-Fox Fire Engine Co., died January 26 at his home, 3212 Observatory Road, Hyde Park, Cincinnati, Ohio. He was 89.

He leaves his widow, Mrs. Ella G. Fox, and a stepson, Ralph E. Hoffmeister, both of Cincinnati.

Mr. Fox designed one of the first motorized fire engines in the United States.

He often said he was born to be a fireman. He aided his fireman grandfather on an old hose cart, but it was a tragedy that set the pattern of his career.

A brick wall fell while he was helping fight a big downtown blaze and trapped a companion. Shortly afterward Mr. Fox joined the fire department.

The young fireman began to think seriously about the future. He spent his spare time at a hay loft drawing board. He drew plans for the remodeling of the firehouse at which he was stationed. The plans were accepted. The word got around. Before long he was assistant chief, designing the stations.

A decade later he joined the Ahrens Manufacturing Co. One of his first inventions was the Fox boiler which great-

SENSIBLE

FOR ALL YOUR HOSE CONNECTIONS

improved

SENSIBLE LUG COUPLINGS

insure

QUALITY *and* SAFETY!

The improved Powhatan "Sensible-Lug Couplings" are precision tooled and manufactured of only the best high grade materials. They set a standard that is "tops" in this specialized field of fire-fighting equipment. The curved surfaces of this modern coupling enable the hose to glide easily over all obstructions, thus preventing snagging, an important safety and economical feature appreciated by those who know.

Specify "Sensible"

POWHATAN BRASS *and* IRON WORKS

RANSON, WEST VIRGINIA

Phones 93 & 94 Charles Town West Virginia

Established 1892

ly increased the efficiency of the fire engines.

Shortly after the turn of the century, with members of the Ahrens family, he founded a new firm. It joined in the fight for business that followed the appearance of the fire truck.

Charles H. Fox

Mr. Fox's inventions in the field of designing and improving trucks, pumps, aerial ladders and other fire-fighting equipment paid off. In one competitive test in New York in 1913 the Ahrens-Fox pumper was still going after 12 hours of high-speed operation. It was a crowning achievement.

Mr. Fox, who later retired after serving as chairman of the board, was awarded the Modern Pioneers of Research and Invention award by the NAM.

Mr. Fox was born in Cincinnati Dec. 16, 1860. He was active in business until 1940, retiring as president of the Ahrens-Fox Co.

He was a member of the Society of Automotive Engineers, the Engineering Society, Syrian Temple Shrine, Scottish Rite, and the International Association of Fire Chiefs.

New York Fire Chiefs Hold Mid-Winter Meeting

The Board of Directors of the New York State Association of Fire Chiefs met in Albany, N. Y., January 18, 1950. Chief William Wayand of Scotia, presiding. Most important business transacted was the selection of Elmira, N. Y., as place of the 1950 Convention. Dates set are June 4, 5, 6 and 7. Chief Lewis J. Mosher will be the host chief.

A number of changes to modify the Constitution were approved for final consideration at the forthcoming Convention. Thomas W. Ryan, Director, N. Y. State Division of Safety, expressed gratification over the assistance given his Division by the Association.

There was considerable discussion on the Mitchell Bill on multiple housing, presently before the New York legislature. It was voted to support this Bill (Senate Bill No. 19) and members were urged to press for its passage.

The Board also affirmed its conception of regulations that red lights and sirens be restricted to emergency use only. The Legislative Committee was empowered to take such action as deemed necessary.

A proposal for a law forcing each fire chief in the state to make a complete report of each fire in his area within 48 hours to several different agencies, state and local, was tabled. It was believed such a law could not be enforced at this time.

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PENETRANT

B makes "WETTER WATER" for Fire-Fighting

Wherever water can be used, UNOX Penetrant "wetter water" will put out fire at least 2 to 3 times faster than plain water.

The speed and effectiveness of this "wetter" and BETTER water show up dramatically in quick knockout of fires that are too stubborn for plain water. These include flammable-liquid spill fires and fires in baled cotton and upholstered furniture.

But experience has proved that UNOX Penetrant is not just a specialty item. When properly mixed with water, it does a much faster extinguishing job wherever or however it is used against fire.

So order UNOX Penetrant today! Increase your efficiency—start "wetter water" fire-fighting now.

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FIRE EXTINGUISHER

EASIER TO HANDLE — lighter in weight by 7 to 15 lbs.

FASTER IN ACTION — 10' x 10' pit of blazing gas and oil *all out* in seconds.

PENETRATES CREVICES—completely blankets wide area.

ELIMINATES RE-IGNITION—works in winds and drafts.

NON-TOXIC, NON-CORROSIVE — harmless to everything but fire—including food.

SAFE ON ELECTRICAL FIRES—non-conductive.

FAN SHAPED NOZZLE — ejects flat stream; screens off flame from burning material; safeguards operator.

Only "ALL-OUT" gives *all out* protection. Demonstration anywhere, anytime. Write today for illustrated data.
Model A-16 illustrated, has 15 lb. capacity Model B-10 contains 10 lbs of dry chemical.

Protects the operator as it kills the fire.

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2 PARK AVENUE, NEW YORK 16, N. Y.

The WATCH DESK

Overhauling the firemanic news of the day

by ROI B. v OOLLEY

Burning Santa Laughs Self to Death

Cryptic caption, that, but it's true! In Asbury Park, N. J., a Santa Claus went right on laughing, with his pants burning, his shirt smoldering and his snowy whiskers a mass of flame.

Santa was part of a Christmas display in a local department store window. Every few minutes he rocked back and forth while his laughter boomed out into the street. Uh huh—he was "mechanized."

A short circuit in the rocking mechanism set old Santa afire, brought the Brothers in a hurry, together with plenty of gaping onlookers. While a detail of the fire fighters picked the old Boy to pieces, the record containing the laughter, which was attached to a separate mechanism, went right on playing.

As the Brothers left the store, and a badly wrecked St. Nick, Fire Chief Michael J. Ryan assured a group of sad-eyed youngsters who had watched Santa's destruction that everything was was OK—the real article would be on hand Christmas eve. (Thanks to several who sent in this item.)

* * *

The New Peck—Peck—Peck Fire Alarm

Gag-writers could go ga ga with this one! It's all about the wierd contraption down in Fleetwood, near Reading, Pa., that provides chickens with water, and how it helped save a barn from destruction by fire.

Ludwig Jorsczwk (you pronounce it) built the gadget to enable his thirsty chickens to get water when they wanted it. What he did was to connect a pipe that ran from his home to the barn and chicken house in such a way that all the hens and roosters hadda do when thirsty was to peck at the end of the pipe, where upon out would come water. The pecks would set off a bell in J's house, where upon some kind soul would turn a valve.

On November 25th last, to be exact, whether 'twas thoughts of Thanksgiving or something else, the pa and ma hens were unduly thirsty—or so Jorsczwk thought. When the pecking and pecking kept up long after he had loosed enough water to float the fowl he investigated—to find his automobile in the barn on fire.

Jorsczwk, by fast work, managed to confine the blaze to the car until firemen arrived. Deponent sayeth not how he rewarded the feathered alarm system! (Thanks IRVING JOHNSON.)

* * *

Precaution Causes Death

In Pontiac, Mich., Mrs. Frances Connor kept a knotted rope tied to a radiator near the window of her fourth floor apartment. She'd done this ever since the fatal Winecoff Hotel fire in Atlanta, three years ago. An Alabaman, Mrs. Connor vowed she would never be trapped in a fire in her building.

On December 8th last, paper on a back stairway caught fire from an unexplained reason. Smoke filled the hallways of the apartment building. Mrs. Connor smelled the smoke, flung open her window, tossed out the rope and started her descent to supposed safety. But she lost her grip and fell to the concrete driveway. Her skull was fractured and she died in a hospital three hours later.

"She always had a fear that fire might occur," said her husband, Lynn. "She never forgot the Winecoff fire. She insisted that we always have a rope handy."

The fire? Deponent saith not. Presumably it went into the records as "inconsequential."

* * *

Believe It or Not—Stomach Pump Saves House

The 'Ripley' of the month—In Parkville, Mo., a stomach pump put out a fire where a bucket brigade failed!

Dr. T. M. Eagle, a veterinarian, was driving by a house in Parkville, when he noticed smoke coming from the attic of a house. He climbed a ladder and broke in an attic window to throw water on the small blaze while other folks turned in an alarm for the local volunteers, and grabbed for buckets.

The good doctor found the attic space too cramped for him to maneuver and while other motorists used buckets of water, thrown in the general direction of the fire, the doctor ran to his car for his stomach pump and 12-foot rubber tube (seems the veterinarians need especially long 'hoses').

Then the doc' hustled back to the fire, jammed the tube in a bucket and passed the "hose" to Highway Patrolman Rosco Laurie, on the ladder. While bystanders kept the buckets of water coming, and Doc worked his improvised "fire pump" the officer kept a small stream on the fire, which was pronounced out when the vamps arrived!

The pump, a two-way apparatus used for pumping out stomachs and administering medicines to animals, threw a stream about 15 feet into the attic, it's said. Damage was estimated at $50 and the vamps were urged to sign up Dr. Eagle! (Thanks W. A. MCDONNELL)

* * *

High Jinks in Highland

It's high time something was done to halt highjacking of Highlands, N. J., Hook and Ladder Company's high test fuel supply, avers Herbert Hartsgrove, Borough Councilman of Highlands.

According to the Councilman, the fire department's ladder truck has failed to respond to alarms "twice in the past three months." The reason? Some miscreant had stolen the entire 30 gallon gasoline supply of the apparatus in each case.

Hartsgrove laid his case before the council meeting, adding that he couldn't see how this state of affairs could come about—the firehouse is right next to the borough's police headquarters.

Thanks EDW. SPRANGER

* * *

Why Fire Trucks Have Gotta Be Good

An item in the Worcester Telegram, bearing a heading "New Broom Sweeps Clean" and labelled "GROESBECK," goes as follows: "This village's newly-purchased fire apparatus proved itself in working order in double-quick time. The volunteer firemen were holding a dedication party when a building caught on fire. The complete department, 35 strong, drove to the fire in their new truck and

put out the blaze in near-record time."

We've always thought fire apparatus was a lot better than most folks considered it was! Thirty-five vamps on a single rig—and brand new at that! Well, it's a wonder the job ever arrived, at the scene. Thanks FRANCIS BURKE

* * *

Hot Off the Tape

Firemen of Atlanta, Ga., went "Booker-to-Booker-to-Booker" in response to a telephone alarm one night. The cellar reported a fire at "Booker street," but failed to state which Booker—northwest or southwest. The Brothers tried both. No fire. Assistant Chief H. G. Pierce, meanwhile, found the fire at Booker avenue southwest, but by the time other fire fighters reached the scene, two houses had been destroyed (thanks LAWRENCE FEIHEL) . . . A Queens, N. Y., mother critically wounded her 13-year-old daughter with a hammer, used kerosene to set fire to her apartment, then jumped six stories to her death. Firemen quickly extinguished the fire, rushed girl to hospital in dying condition. . . In New York City, Ladder 20, en route to an alarm from Second avenue and Third street, collided with a commercial truck at Broadway and Houston streets. Seven firemen were injured including Captain Charles Wolfinger—none dangerously. Ladder was taken out of service. Commercial vehicle driver got a summons. . . . In Philadelphia, two firemen suffered internal injuries when their truck, responding to an alarm for a small closet fire, collided with a fish truck at Ridge and Glenwood avenues. They were hospitalized. . . . Grass fires in January are a bit rare in New York City, but one took the life of a 3-year-old boy when he stumbled into it in a burning lot near his home in Queens. He was wearing a snow suit at the time which became ignited . . . Fireman Peter Engel, 60, of the Fireboat McClelland, N. Y. F. D., was killed when he fell from a plank in the engine room, while the vessel was undergoing repairs. . . . When a trailer truck ran off the road near Esopus, N. Y., the cargo of soda and paper bags took fire, and the driver burned to death. . . . New York State has ordered additional fire escapes for two buildings at the Hudson River State Hospital, Poughkeepsie. Work includes two aluminum chutes for non-ambulatory patients. . . . A 42-year-old Bellevue Hospital (N.Y.C.) clerk has admitted setting a fire in a record cabinet in the huge hospital "on impulse." He denied knowledge of six recent fires of suspicious origin, according to Martin Scott, Deputy Chief Fire Marshal, who with his staff has been on the watch for weeks. Culprit has been employed by the institution for 25 years! . . . Five of twelve children of a Missoula, Mont., family died when fire flashed through their two-story frame home, a male baby sitter and six children escaped. Parents were away visiting. . . . Three small boys of Brooklyn, N. Y., started a fire that caused considerable damage to P. S. 4 that borough. Excuse was "they didn't like teachers." . . . A 9-year-old boy in Cumberland, Mo., admitted to sounding a false alarm that resulted in injuries to three firemen. A fire truck, which answered the false call, crashed through a store window after collision with an auto. Firemen were not seriously injured. The worst the lad will get, will probably be a scolding.

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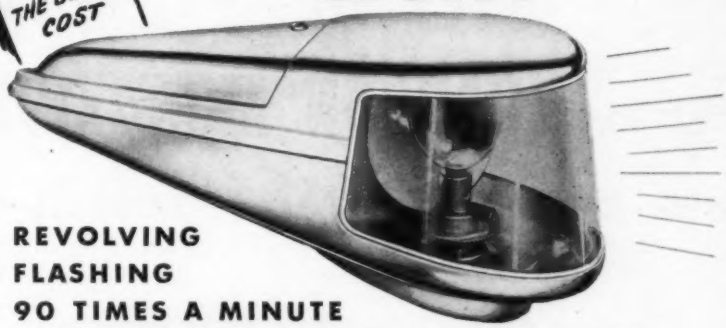
1/2 THE USUAL COST



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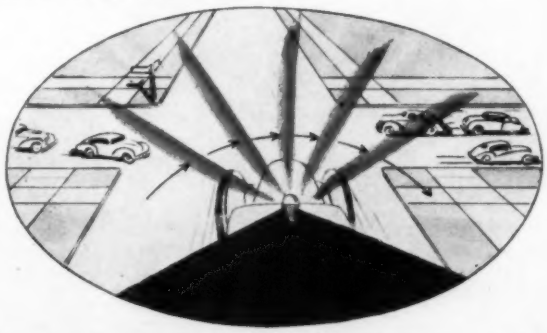
by day, a mile or more at night. Its 100 to 150 candle power source (not 32, not 50) warns traffic even in the worst weather.

FROM EVERY ANGLE THAT COUNTS—front, sides, ⅓ to the rear on both sides, full 240°—but masked behind so observers, seeing red, know *which way it's rushing.*



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News of the Manufacturers

Powhatan Brass Gets Prominence

The Powhatan Brass and Iron Works of Ranson, W. Va., received much prominence in a recent story in the *Jefferson Republican* about the growth of Jefferson County and Ranson, in that State.

Since 1892, this company has been a basic industry in the growing area. It is located on Route 9 in the western edge of the Ranson town limits and is headed by Charles F. Reininger, who rose in 31 years from shipping clerk to president. His son, Charles, Jr., was killed while serving with the Marines in the last war.

The Company, which produced vital war equipment for the Armed Forces during both World Wars, is perhaps better known for its various items of fire protection equipment. According to the *Jefferson Republican*, the present Powahatan plant can produce "without outside assistance, any type or design of fire protection items . . . any type of fire equipment for fire departments; fire protection for boats and also just about any fire protection and preventive items for the home."

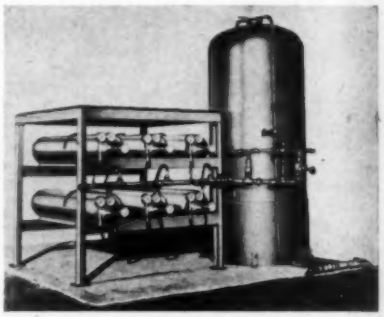
Ansul Introduces Stationary Unit

With the introduction of its large stationary fire fighting units, Ansul Chemical Company is making a bid for new markets in the rapidly expanding field of dry chemical fire protection.

These units are being built in 500 lb., 1,000 lb., and 2,000 lb. capacities. They are designed to protect wide areas where a minimum of manpower is available—such as gasoline bulk plants, gasoline storage areas, refineries, railroad yards, petroleum and natural gas fields, large chemical plants, liquefied petroleum gas tank farms and other major public utility hazards.

By developing this new fire equipment, Ansul is aiming at industries where only one employee, such as a night watchman, is available for emergency fire duty. One person can operate the Ansul stationary unit and fight a fire in any portion of an area several acres in size.

The stationary unit itself consists of a centrally located steel tank containing dry chemical and nitrogen cylinders



New Ansul Stationary Unit

(used to pressurize the tank). Piping runs underground from the tank to one of more hose houses where one-inch chemical engine hose is coiled. Hose may be obtained in 50, 100 and 150-foot lengths.

Rate of flow of dry chemical is 450 lb. per minute. Recoil, a problem with this high rate of discharge, has been minimized by a specially designed nozzle. Effective range is about 35 feet.

The 500 lb. unit is equipped with a 365 cu. ft. nitrogen cylinder. The 1,000 lb. model is pressurized by two of these cylinders, the 2,000 lb. unit by four. Number of hose houses and piping outlets are determined by each customer's needs.

Farm Fire Protection Contest Launched

At the November, 1949, annual meeting of the Agricultural Committee of the National Fire Waste Council, of which Dennis C. Smith, Assistant Manager, Farm Department, The Home Insurance Company, Chicago is Chairman, the Council launched a National Contest for Farm Fire Departments. The contest was inaugurated to lend encouragement by national recognition to those valiant fire fighters who provide rural America with fire protection and to enroll these thousands of men in an aggressive farm level rural fire prevention program.

Harry P. Cooper, Jr., Secretary National Association of Mutual Insurance Companies of Indianapolis, headed the Sub-committee of the Agricultural Committee which spent over two years in the development of the plans and rules

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IT *breathes* for the victim

IT *mixes* air with oxygen as the victim rallies

IT *adjusts* to lung capacity

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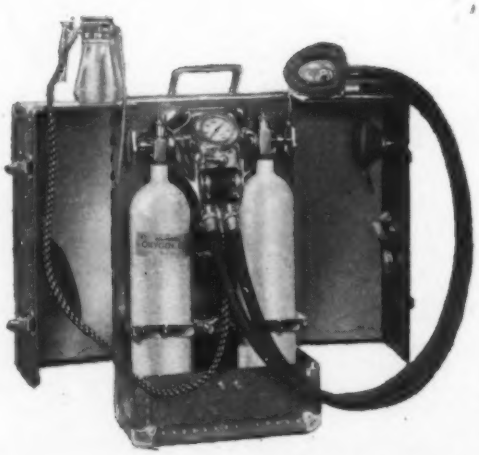

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WRITE TODAY FOR LITERATURE OR DEMONSTRATION

for this national contest. Meetings were held in Chicago and Washington, D. C., and in the final plans a number of features were incorporated which came from suggestions in a meeting held with twenty-five rural fire chiefs and small town chamber of commerce secretaries from three different states.

The Council, recognizing the tremendous increase in farm fire and injury hazards which has come about in the transition of agriculture from the old horse-drawn plow and cultivator days to the modern machinery operated farm as it is found today, now proposes with this national contest to enlarge its program of Rural Fire Prevention and Protection through Chambers of Commerce which has been the principal activity of the Agricultural Committee for the past two years.

The contest requirements are simple and few and can be met by all fire departments serving farm areas. Participation in the contest will require the completion and filing of a report of farm fire department activities which will consist of three divisions and identification information. The three divisions comprise Loss Record information. Fire Protection Equipment information and Fire Prevention Work information. Contesting departments will be divided into three classes which will assure equal opportunity to all as each contestant will be competing against departments of comparable size.

The contest will be judged by six competent men of national reputation including the Editor of "Firemen" and the Editor of FIRE ENGINEERING, and a representative of the National Association of Mutual Insurance Companies, the National Board of Fire Underwriters, United States Department of Agriculture and the National Association of Farm Editors. The judges will select a State Winner in each class who will be awarded an engraved certificate suitable for framing. From these State Winners will be selected a National Winner in each class and one Grand Prize Winner, each of whom will receive a properly inscribed handsome trophy of a Rural Fireman figure on mahogany base. Each contestant completing and filing a report will be given a certificate of participation by the Council.

Contest competition will begin July 1, 1950, and the first annual contest will close on June 30, 1951. All entries will be filed through local Chambers of Commerce which are members of the national Chamber and located nearest the area served by the Contestant Department. Entry blanks and Report Forms will be supplied by Chamber Secretaries. The name of the closest Chamber of Commerce may be obtained by any Department desiring to enter by writing the National Fire Waste Council, c/o Chamber of Commerce of the United States, 1615 H Street—NW, Washington 6, D. C.

Another Sliding Pole Injury

Deputy Chief Thomas H. Veech of the Passaic, N. J., Fire Department was seriously injured on December 30, 1949, when he suffered a compound fracture of the left foot and ankle when he slipped, while sliding down a pole at Passaic Fire Headquarters. At the time, he was responding to a box alarm which was sounded at 3:00 P.M.

—RICHARD ADELMAN.

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No. 900 Shut-off Nozzle with Play Pipe

No. 937 Exhaust Whistle

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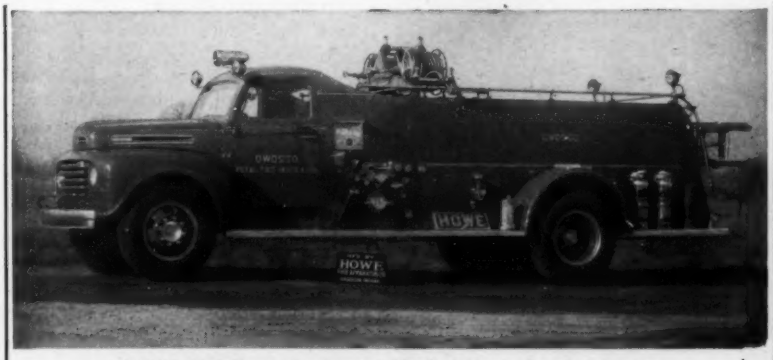

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For Practical Discussion of Current Fire Department and Fire Management Problems

FLOOR FURNACE TROUBLES

THIS month's problem upon which chiefs were asked to comment has to do with installation of floor furnaces, their flooding under certain conditions, resulting in extinguishment of pilot lights, and the measures taken to enforce proper installation.

In general, the many chiefs reporting had encountered little or no difficulties from such flooding. The major furnace and heating difficulties, it is disclosed, come from other causes, such as improper operation and poor maintenance.

A number of chiefs reported trouble arising from floor furnace installations where ground moisture had rusted out the bottom of the furnaces. At least one blamed salt sea air for furnace degeneration. Several commented on the mistake of locating such heating equipment where it is difficult to get at.

Several chiefs emphasized the need of adequate clearance, to keep the unit above normal flood or seepage stage. One city, which does not permit installations of such furnaces, insists that heating systems shall be as much as 36 in. above floor level. A few recommended the installation of waterproof walls, or collars, around these furnaces, erected to a safe height above floor to prevent seepage or flooding.

Although many cities reported the ground or surface contours such as to prevent seepage and flooding in their areas (by proving run-off) as many more reported some occasional difficulty with sewage and ground water overflow and seepage. A few cities have had difficulty only at certain flood periods.

The majority of cities and towns reporting had regulations governing the installation of heating systems. A few prohibit the use of floor furnaces. Others designate the conditions under which they shall be installed. A few are governed by the standards of the Warm Air Code Guides. Many include provisions for proper maintenance of such installations, and to prevent poor carburetion and power failures. Some insist on curb shut-offs for fuel lines and/or float shut-offs where gas is used.

A few respondents admitted no regulations to cover either installation or maintenance and operation of such heating systems. The concensus of opinion was, however, that regulatory measures are essential, and should be enforced.

Enforcement is generally up to the local building department or fire prevention bureau.

Readers are invited to send in their comments on this subject which will be continued in the next issue. Address replies to Round Table Editor, FIRE ENGINEERING, 24 West 40th Street, New York 18, N. Y.

Discussion of the Topic

R. L. Woolard, Chief, Norfolk, Va.: We have had comparatively little or no trouble from flooding conditions extinguishing pilot lights of the hundreds of floor furnaces, all of which are oil-fired. The only trouble of this particular nature was experienced recently in a new housing project, when the rupture of a surface water pipe flooded out several floor furnaces, extinguishing the pilot light. This condition was immediately reported by the occupants to the Bureau of Fire Prevention, who made an investigation of the condition, and ordered the furnaces to remain out of service until the water pipe had been repaired and the furnaces properly serviced before

HERE IS THE PROBLEM

1. **Have you experienced any trouble in recent years with floor furnaces (both gas and oil fired) due to heavy rains, ground seepage or backing up of sewers, flooding pits beneath the units and extinguishing the pilot lights or fires?**
2. **If such troubles have not been encountered, how have they been avoided?**
3. **Have you regulations governing the installation of flame furnaces of the above types which require placement of units above the point where accumulation of water might affect them?**
4. **Who enforces such regulations?**

permitting them to be placed in use again.

The greatest trouble in Norfolk with regard to floor furnaces is three fold: 1. Due to a salty atmospheric condition and a certain amount of ground moisture we find the bottom of the furnace soon rusts out; 2. improper operation, and 3, poor maintenance.

Before any person, firm or corporation may install any form of heating equipment in Norfolk, a permit must be obtained from the Public Safety Director, and the premises inspected by the Bureau of Fire Prevention before the installation may be started. If in the opinion of the fire inspector, the installation would not be safe, he may disapprove and the permit be revoked.

Should the installation be approved, the final inspection must show that the bottom of the furnace is at least six inches above the ground level. Where the ground must be excavated to provide this clearance a waterproof concrete pit must be provided. The bottom of the furnace shall be at least six inches above the bottom of the pit and the sides of the pit must extend not less than four inches above the ground level.

The regulations covering such installations are well defined in Paragraph 608, of the Fire Prevention Code of the City of Norfolk, and require that the warranties of the National Board of Fire Underwriters be strictly adhered to. As an aid to the installers of floor furnaces in Norfolk, the fire inspector prepared 500 mimeographed copies of the regulations covering the installation of floor furnaces, as outlined in the building code of the National Board, and has distributed them to all persons engaged in such installations. Through this media much trouble and confusion has been overcome.

The enforcement of the regulations covering these installations is delegated to the fire inspector. Where legal action is necessary, the fire inspector must refer the matter to the fire chief, who is authorized and empowered with the approval of the public safety director, to institute or cause to be instituted all legal action.

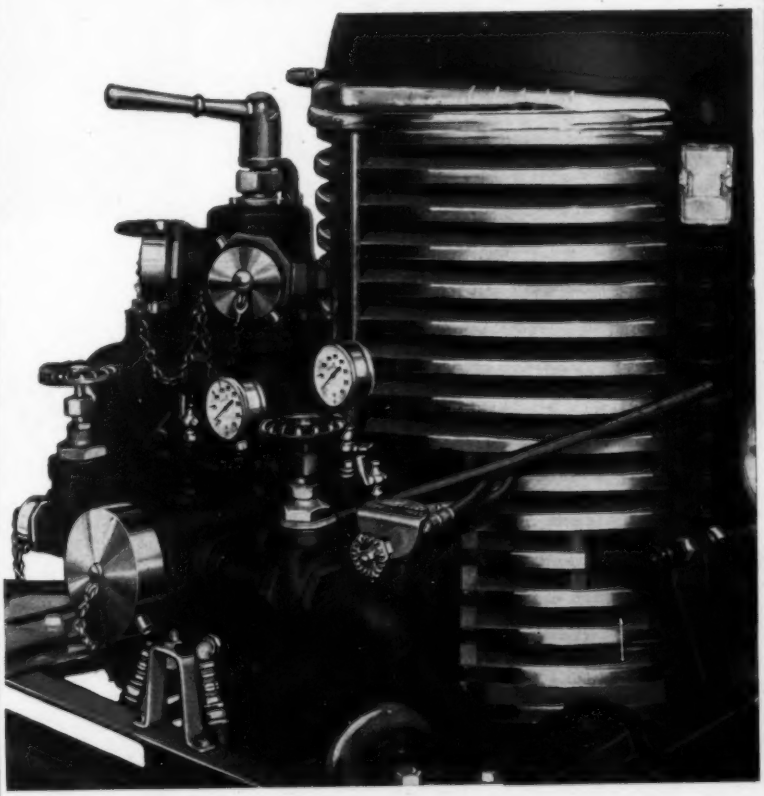
Frank H. Burns, Chief, Grand Rapids, Mich.: We have not experienced any trouble in recent years with floor furnaces caused by ground water seepage or other difficulties which would extinguish the pilot light or fire. The only trouble we have encountered is that occasionally an installer will place this type of furnace in a location where no means of entering the area between floor and earth has been provided. In this case, the only way to service the unit (even to merely relight the pilot) is to entirely remove the whole unit from the floor.

The trouble with ground water and seepage, such as you mention, has been avoided here largely because of our up-to-date and comprehensive heating ordinance. In this ordinance there is a section which very specifically states that any floor furnace shall be installed with ample clearance to insure that no trouble with ground water will be experienced.

The heating ordinance of this city covers any and all equipment used for the production of power, heat, or air conditioning, and embraces all types

Our latest achievement!

BARTON-AMERICAN MODEL UA



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NEW WAY
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FIRE DEPT. MODEL

Today's laddermen lower victims on the DAVY automatic Fire Escape. Just hook onto ladder rung—place strap under victim's arm pits—lift out of window and the DAVY does the rest. Lowers victim slowly and leaves ANOTHER strap to lower second victim. Any number of people can be lowered FASTER and SAFER with NO RISK to either victim or fireman.

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Proven in over 40 years' use in Europe and America. Will lower person 20 stories in about one minute—soon as one person reaches ground another strap is ready for second person and so on—FASTER than raising a ladder—safer than any other rescue device—fully automatic—lasts for years and years. Recommend it now before catastrophe occurs!

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Fire Depts. everywhere are in immediate need of the "DAVY" Automatic FIRE ESCAPE. Sell one model to all fire depts., sell another model to hotels, etc. Write for dealer proposition.

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Model 20 SIRENLITE—a powerful siren combined with an automatically flashing red light.

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58 Allen St., Rochester 6, N. Y.

of fuel. Installers are licensed annually by a board of examiners after an examination has been passed, and a permit is required for each installation.

Applications for licenses and permits are made at the office of the city building inspector and all inspection work and enforcement is performed by the Fire Department Inspection Bureau.

Connie O'Sullivan, Chief, Memphis, Tenn.: We have had trouble in the past with floor furnaces due to heavy rains, ground seepage or backing up of sewers.

We now have an ordinance governing the installation of gas floor furnaces and other gas appliances.

Regulations are enforced by the Gas Inspection Bureau of the City of Memphis. This Bureau was organized about two years ago, and since that time such trouble has been greatly reduced.

Ernest Kleber, Chief, Aliquippa, Pa.: We had trouble with one gas furnace due to backing up of sewers. Storm sewers were put in that locality and eliminated further trouble.

J. E. Coultas, Chief, Canton, Ill.: We have had some trouble with floor furnaces. When this happens here, they just pump out the water as soon as possible and attempt to remedy the cause. New installations are built up high and dry.

We have avoided trouble by installing adequate sewers and drainage. If this is impossible, a wall is built around the unit which is higher than anticipated floor height and a sump pump is installed within.

We have nothing in our laws, to my knowledge, governing this point. Our greatest trouble comes from furnaces being built too close to wooden floors and walls.

E. H. Kline, Chief, Columbus, Ind.: We have had very little trouble of this type since we are on fairly high ground. The recent flood only affected one or two and it would have made little difference how high the furnaces were. The building inspector is responsible for installations of this kind.

William H. Davis, Chief, Bureau of Fire, Pittsburgh, Pa.: Pittsburgh has experienced very little of this type of trouble in late years. The city uses an absolute minimum of oil heating. By city ordinance only a smokeless mixture of coal is permitted for domestic and industrial heating. This has caused a large percentage of consumers to convert to gas. In addition, two large sections, the downtown business section and the Oakland Civic Center are entirely steam heated from a central power plant operated by a local utility.

We have a Warm Air Heating Division of the Bureau of Building Inspection to enforce its regulations.

Ray H. Earle, Chief, Massillon, Ohio: About two years ago the City of Massillon set up a heating code. This has recently been set up under the Fire Prevention Bureau of the Fire Department with a captain as heating inspector.

The code covers all types of gas furnaces and requires that floor furnaces be installed in the same manner as other type furnaces and must be vented through regular vents as is required on other heating units. It requires that the space be panned out

and cemented in under and around the furnace so that there is no chance of seepage putting the pilot light out.

At the present time we do not have very many of the floor type furnace. These are all gas fired and have given us no trouble as yet. Of course, there are probably some that were installed before the code, but we believe we helped that condition by getting plenty of publicity on the code and the dangers of shoddy installation.

We have also found that an inspection made by a trained fireman is superior to that made by a layman, mainly because the heating code was originally written as a safety code and not an engineering one. Our experience has shown that installation of the furnace gave us more trouble than the construction of same.

I have heard of some trouble in a few housing projects outside the city where water seeped into the pit and extinguished the fire.

In the installation of floor furnaces, gas fired, our code follows the requirements of the East Ohio Gas Co. Similar requirements cover conversion burners. Oil fired floor furnaces are covered by the rules and regulations of the Fire Marshal's Office, State of Ohio.

Herbert F. Travers, Chief, Worcester, Mass.: This problem occurs quite frequently in Worcester, to the extent that assistance is requested to avoid the trouble.

Drains located where water accumulates are able to handle the trouble. The drains must be kept open and serviceable by proper inspection at intervals. Where water must be raised to a certain level to reach sewer line a small automatic electrical sump pump does nicely.

We have no regulations governing the installation of flame furnaces of the floor type.

J. F. Finnegan, Chief, Richmond, Va.: We have exeprienced trouble with floor furnaces due to heavy rains, ground seepage or backing up of sewers, flooding pits beneath the units and extinguishing the pilot lights or fires.

We have no regulations governing the installation of these units.

If we may express an opinion, we believe that regulations should be set up governing the installation of floor furnaces, and they should be enforced by the building commissioner.

The Building Department receives all plans for construction; they have an inspector on the job and we feel they are in a better position than other departments to catch installations of this type before work is started.

Leo S. Considine, Chief, Bureau of Fire Prevention, Buffalo, N. Y.: We know of only a few floor furnace installations in use in buildings which are not provided with cellars. In each of these instances there is a sufficient clearance above the grade level so that normally heavy rains or seepage would not interfere with proper operation.

With regard to enforcement of regulations, this department has the power to invoke the requirements of the N. B. F. U. in the event that a condition is created, which may cause trouble, due to seepage. We would insist that a waterproof pit be installed of a sufficient depth and carried above a low grade line to prevent water from entering.

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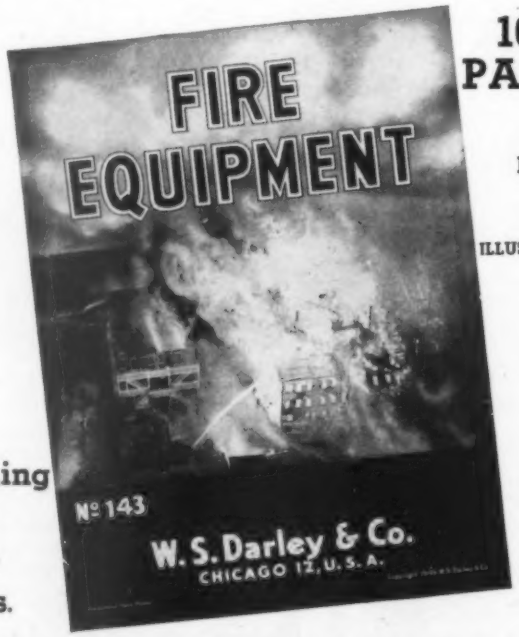

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Persons in the News

J. A. Neale Made Chief Engineer N.B.F.U.

Appointment of John A. Neale as chief engineer of the National Board of Fire Underwriters was announced in New York by W. A. Mallalieu, general manager. Mr. Neale at present is vice prseident and chief engineer of Underwriters Laboratories Inc., of Chicago.

Mr. Neale is a graduate of Tufts College Engineering School, with a degree of Bachelor of Science in Civil Engineering. After leaving college, he worked for the Associated Factory Mutual Fire Insurance Companies as an inspector and later served in the U. S. Army during World War I as a lieutenant of artillery.

J. A. Neale

After the war, he joined the Tennessee Inspection Bureau and organized an engineering department handling municipal fire protection, inspection of sprinklered risks and general fire protection engineering.

He became chief engineer of the Chicago Board of Underwriters in 1924 and joined Underwriters Laboratories Inc., Chicago, as Protection Engineer in charge of department testing and listing of building materials in 1938.

Later, he became chief engineer in charge of the burglary protection, casualty and automotive, chemical, hydraulic, building materials, combustion equipment, gases and oils departments.

Mr. Neale, who will report for duty on March 1, succeeds the late Calvin G. Lauber, acting chief engineer, who died suddenly on January 4. Mr. Lauber succeeded George A. Booth, who retired on December 31, 1949 after serving 39 years as head of National Board's engineering staff.

Lindsay Heads Fair Lawn, N. J., Volunteers

Robert Lindsay, Deputy Chief of the Fair Lawn, N. J., Fire Department, was elected Chief in December, 1949. Captain Arch Brown, of Engine Company 2, was voted Deputy Chief.

The retiring chief is Paul Peterson, who also served as Deputy Chief and Captain of Engine 4.

RICHARD ADELMAN

Fifty Years of Service for Chief Brosnan

Chief D. W. Brosnan has just celebrated his fiftieth anniversary of entering the Albany, Ga., fire department.

The history of his half decade of public service has established an international reputation for himself, his department and his city in the field of fire fighting and fire prevention.

On the walls of his No. 1 station hang no less than seven United States Chamber of Commerce national awards as America's foremost "fireless city."

In his record books are unbelievably low fire losses ranging downward to less than 20 cents per capita one year.

Chief of the department for the last 39 years, the man who rose through the ranks and later became the president of the International Association of Fire Chiefs points with pride to three aspects of his remarkable record since becoming chief in 1911:

1. No person has lost his life or been injured in a burning building.

2. No fire has spread to another building from its point of origin.

3. No fireman has so much as broken a finger working at a fire under his direction.

Albany's fire loss for 1949 was only $24,000 for a city of 45,000 persons, less than 60 cents per capita.

Under his direction the department has grown from a strength of six men to 43. Salaries have climbed constantly through his persistent pounding, and largely through his efforts, the City two years ago inaugurated a pension plan for firemen and all other employes.

Chief Brosnan always has stressed salvage and mop-up operations at fire scenes to reduce the scope of damage, particularly by water.

He has been building inspector of the City of Albany for almost as many years as he has been fire chief.

He dovetailed the jobs. When new buildings are planned he insists on the strictest adherence to a building code which he helped draw and is patterned after the National Fire Underwriters code.

The purpose of all this, he explains, "is to see that all buildings have safe, easy exits for use in case of fire, and cutoffs to retard the spread of fire.

Becker Made Buffalo Fire Commissioner

The new Buffalo, N. Y., fire commissioner is Harold R. Becker. He succeeds Joseph S. Masterson, Buffalo's fire commissioner for the last four years. Commissioner Becker took office Jan. 1.

Under Buffalo's political setup, it is traditional for each new mayor, regardless of affiliation, to appoint new fire and police commissioners. Buffalo's mayors may not succed themselves, so each fire commissioner's tenure is comparatively short.

Commissioner Becker, who is 50, served the last four years as deputy fire commissioner under Masterson. Shortly after his appointment by Mayor Joseph Mruk, Becker announced appointment of one new deputy fire commissioner. He is Capt. James Forhead of Engine 1. Commissioner Becker also reappointed Deputy Fire Commissioner Harold G. Rainey.

The new commissioner comes well

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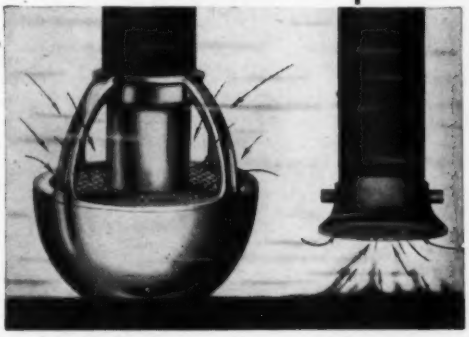

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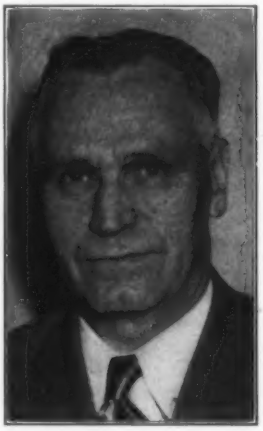
qualified to his post. He joined the department on Feb. 15, 1925, and was made a lieutenant on Jan. 1, 1933. He became captain on July 16, 1936, and battalion chief on Jan. 1, 1941.

During World War II, Commissioner Becker was in charge of the Buffalo Fire Defense Bureau. He also trained 200 Coast Guard recruits in fire fighting fundamentals.

He originated the old Buffalo Fireman's Night School in 1928. The school was discontinued in 1933. Among the new Commissioner's plans is one call-



Harold R. Becker

ing for reinstatement of the training school. He notes that most all of the firemen completing the night course later became officers in the Buffalo fire department.

Commissioner Becker also originated and instructed at the Erie County (greater Buffalo area) Fire College, the Erie County Mutual Aid System, the Fireman's Gas and Rescue School and the Buffalo Auxiliary Fire Corps.

He directed Red Cross training in the entire Buffalo Fire Department and is author of a "Training Manual With Teaching Outline for Professional, Volunteer and Auxiliary Firemen."

Chief R. M. Hitchings Retires

Roy M. Hitchings who has been Chief of the Flint, Mich., Fire Department since 1936, retired on January 1 after almost thirty-four years of service.

Chief Hitchings joined the department on May 1, 1916, was appointed assistant chief on September 30, 1930 and chief on September 1, 1936.

Assistant Chief Walter Behrendt has been named acting chief until such time as civil service can certify a permanent chief.

Chief Louis Larson Retires

Chief Louis Larson who has served the City of Manistee, Mich., for thirty-two years as fireman and Chief, has recently retired.

The occasion of his retirement was celebrated with a banquet served in the fire headquarters, at which all city officials and several invited guests were present. Chief Larson was presented with a very complete fishing outfit and also with a gold badge by members of his department.

Joseph Gunner Married

FIRE ENGINEERING is happy to salute Mr. Joseph Gunner of Sydney, N. S. W., Australia, long-time correspondent and avid fire fan. Brother Gunner has become a benedict and has taken a position with the 'tramway.' Nevertheless he finds time to do relief duty on the local fire staff.

Chief Seeks Sales Connection

A young ex-Army fire chief, employed for the past nine years as a civilian fire chief, is seeking connection as sales representative of a fire equipment manufacturer in either East Texas or New England. He is prepared to relinquish his fire department connection promptly if suitable opening is available. He may be contacted through this journal.

Annual Fire Losses Drop for the First Time in Seven Years

Fires destroyed an estimated $667,536,000 in American property during 1949, a figure only 6.1 per cent below the all-time record for destruction set in 1948, it was announced today by W. E. Mallalieu, general manager of the National Board of Fire Underwriters.

This represented the first drop in annual fire losses since 1942.

Fire destruction in December, 1949, was estimated at $67,279,000, an increase of 26.7 per cent over losses of $53,116,000 reported in November, 1949, and a decrease of 3.1 per cent from losses of $69,397,000 reported in December, 1948.

After remaining at a fairly steady level during the years 1939 through 1942, American fire losses began climbing rapidly through the war and post-years. Estimated fire losses for the past ten years are:

1940	$ 306,469,520
1941	322,357,000
1942	314,849,000
1943	380,235,000
1944	423,538,000
1945	455,329,000
1946	561,487,000
1947	692,635,000
1948	711,114,000
1949	667,536,000
TOTAL	$4,835,549,520

These figures represent totals of monthly estimates.

Result of Several Factors

The 1949 reduction in fire losses resulted from several factors, Mr. Mallalieu said. Among them were the intensified fire prevention programs in many American cities, and the slight drop in the general price level, which meant that the replacement cost of burned property was somewhat less in 1949 than in 1948.

"The annual fire loss remains at a very high level," he pointed out. "The 1949 total was more than double the 1942 total.

"Every American can help reduce this waste of the nation's resources by being careful with cigarettes and matches, which together cause a third of our fires, and by following the simple safety precautions which would make home fires a rarity."

Countless fires during 1949 were caused by faulty chimneys, stoves, and furnaces, by misuse of gasoline and

other flammable liquids, and by defective wiring and electrical appliances, he said.

The monthly fire losses in the United States during the year were:

January	$ 57,926,000
February	62,424,000
March	67,218,000
April	55,290,000
May	54,162,000
June	51,787,000
July	49,592,000
August	50,150,000
September	49,678,000
October	48,914,000
November	53,116,000
December	67,279,000
TOTAL	$667,536,000

These reported losses under fire insurance policies include an allowance for uninsured and unreported losses. The figures are based on fire and lightning losses only and do not include losses under any other coverage such as explosion.

"Corrigan Special" for I.A.F.C. Conference

The last time the International Association of Fire Chiefs held its conference in San Francisco, which was in 1939, Commissioner Michael J. Corrigan, of Chicago, Ill., organized a special train on the Chicago, Milwaukee & St. Paul from Chicago to San Francisco which was known as the "Corrigan Special." All who took the trip had such a satisfactory time that many have requested the Commissioner to sponsor another like it to the 1950 convention.

Accordingly, Commissioner Corrigan has recently set up a committee to work out the details for a special train and provide a trip to the San Francisco conference this year. This committee is made up of the following persons: A. J. Mullaney, Chief Fire Marshal, Chicago; Frank Stover, The Gamewell Company, Chicago; James Flynn, Potter Mfg. Company, Chicago; L. J. Benson, Safety Director, The Milwaukee Road, Chicago; James Rustic, American District Telegraph Co., Chicago, and Chief Frank McAuliffe, Fire Insurance Patrol, Chicago, Chairman.

Tentative plans now provide for the "Corrigan Special" leaving from Chicago and travelling the Milwaukee Road, which offers 656 miles of electrification over the scenic Rockies, Bitter Roots and Cascade Mountains. Stopovers are being arranged at interesting points, such as Butte, Mont.; Spokane, Wash., where a side trip will be made to Grand Coulee Dam; thence on to Seattle with trip by ocean liner to Victoria, B. C.; returning to Seattle and on to Portland, with several hours stopover at this most interesting city, arriving in San Francisco the morning of the seventh day.

Those who rode the last Special will remember the club car that was equipped with a bar and music for dancing, to say nothing of the supply of refreshments that filled the baggage car. This will all be duplicated on the 1950 Special.

It is tentatively planned to reach San Francisco the morning before the opening of the conference so that officers and members of the Board of Directors will have sufficient time to attend their advance meetings.

Other groups are invited to attach their cars to the "Corrigan Special" and individuals are extended a cordial invitation to sign up with this big "Special."

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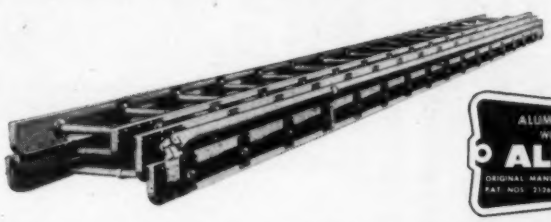

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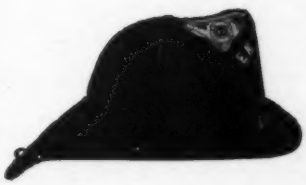

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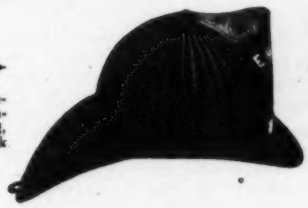

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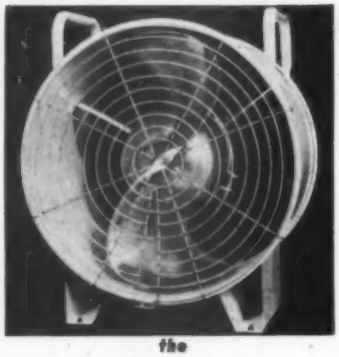

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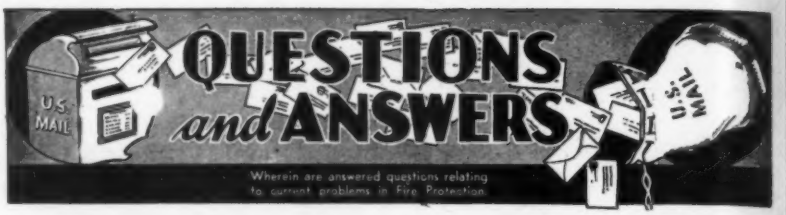

Small Nozzle on 2½-Inch Hose

To the Editor:

Problem No. 88 on Page 75 of "Fire Service Hydraulics" is one I have trouble with. In changing the 1½-inch line to 2½-inch with the factor .074, I am way off in the answer. I get an answer of 169.8 pounds engine pressure as compared to your answer of 123.6.

The problem states: "A pumper is pumping through 1,500 feet of 1½-inch rubber hose equipped with ½-inch nozzle. A pressure of 30 pounds is maintained at the nozzle. What is the engine pressure?

Another thing that I cannot understand is on Page 80 under the heading "Solving for K Value," it says to raise to the fourth power and divide by 10 to get the value of K. But this does not hold true on a ½-inch nozzle.

F. M. O.

Answer: If you use the rule for finding K for ½-inch nozzle on 2½-inch hose (fourth power of nozzle diameter divided by ten) then you must use the formula as follows:

$$E.P. = N.P. \times (1.1 + KL)$$

When you employ the value of K as given in the tables in "Fire Service Hydraulics," then the formula used is

$$E.P. = N.P. \times (1 + KL)$$

Solving the problem by first finding the value of K by the above rule, and using the proper formula, we get:

$$E.P. = N.P. \times (1.1 + .00625 \times 405.4)$$
$$= 30 \times 3.63$$
$$= 108.9 \text{ pounds}$$

This is 14.65 pounds in error, or about 9% error from the value you get by using the formula $E.P. = N.P. \times (1 + KL)$ with the table value of K.

This is considerably less than the error resulting from the use of the formula given in your letter, which shows a total difference of 46.15 pounds, or 30% error. Actually, the results secured by using the formula given in "Fire Service Hydraulics" with the corresponding value of K, which is an engine pressure of 123.6 pounds, is very close to the results secured by adding the friction loss in the line to the nozzle pressure. The friction loss per 100 feet of 1½-inch nozzle hose carrying 40.7 gallons per minute (from a ½-inch nozzle at 30 pounds pressure) is 6.31 pounds. The friction loss in 1,500 feet would be 15×6.31, or 94.65 pounds. Add to this the nozzle pressure, 30 pounds, and we get an engine pressure of 124.65. This differs but one pound from the formula value, which is a remarkably close result.

When you perform calculations on 2½-inch hose employing very small nozzles, the error is apt to be large unless the special formula is used for such layouts. This formula, as noted above, is as follows:

$E.P. = N.P. \times (1 + KL)$, where K is the table value for such layouts.

Heat Actuated Devices

To the Editor:

Name and describe eight different types of actuating devices used for the automatic actuation of fire protection equipment.

G. H. B.

Answer: The following types of actuating devices are used in connection with automatic application of extinguishing agents to fires.

Fusible link: Is common to most sprinkler heads and consists of a soldered link which upon melting releases the water from the sprinkler system. Incidentally, this fusible link is also used for many other fire protection applications, such as releasing carbon dioxide gas, foam, and operating fire doors, etc.

Quartzoid bulb: This consists of a small bulb filled with liquid, which upon expanding when heated, bursts the bulb and actuates a sprinkler head. It can also be used for other applications.

"Rate of rise" detectors: The "rate of rise" detector consists of a hollow metal bulb to which usually is attached a copper tubing. The bulb is provided with a tiny vent which permits air to escape slowly. If the rate of rise of temperature at a fire is such that a pressure is built up in the bulb (the vent hole not permitting escape of air fast enough to keep pressure equalized) the device is actuated. This is used on alarm systems and fire extinguishing systems.

The "rate of rise" unit may be employed without the copper tubing.

Thermostatic cables: These cables, which transmit alarms of fire and actuate extinguishing devices, consist of two common types. The first is a cable made up with a solder core surrounded by an insulating material and, on the outside, a conducting sleeve. When the temperature reaches a certain point, the solder core melts, finds its way through the perforated insulator and makes contact with the outer sleeve, thus transmitting an alarm or actuating extinguishing agents.

The other thermostatic cable consists of two cables twisted together, and insulated from each other by a plastic coating. When a certain temperature is reached, the plastic coating melts, and the cables are brought in contact, closing the circuit.

Thermopile: This is a device wherein a difference in temperature generates electric current, which in turn actuates a relay and thus transmits an alarm or put in operation extinguishing apparatus.

Thermostats: 1. Bimetallic strips fas-

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tened together curve when heated, which either opens or closes an electric circuit. 2. Curved metallic strips when heated come in contact with wiping action, closing electric circuit. 3. Two metallic discs separated by solder and perforated insulating disc are united electrically when solder melts and goes through the perforations in the disc to make contact. 4. A solder pellet between two metal strips melts and makes contact between them when predetermined temperature is reached. 5. A bent spring, held under tension by soldered joint, is released at predetermined temperature and closes switch.

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Electric eye (photo electric cell): This modern unit is used chiefly to detect the presence of smoke in ducts, and other areas, and transmit an alarm when smoke reaches a certain intensity. This unit can also, through relays, actuate extinguishing apparatus.

New York Firemen Ask Pay Rise

The Uniformed Firemen's Association and the Patrolmen's Benevolent Association of New York City seek pay boosts of $16 per week for their members. Heading a list of general benefits sought by members of the two organizations, which represent almost the entire personnel of the Fire and Police Departments, the wage increase, if granted, would bring yearly salaries to $5,000. The present top salary for patrolmen and firemen is $3,800, plus a $350 cost-of-living adjustment.

Other benefits sought include awards to orphans and widows and a plan whereby the city would pay half the cost of hospitalization, surgical and medical treatments.

A 1400 man boost in the fire fighting force, and a 3300 increase in the size of the police force, making the fire department 11,952 and the Police Department 20,000 respectively are also wanted.

Pearl River Department 100% Rehabilitated

Pearl River, Rockland County, N. Y., is another one of those enterprising volunteer departments that takes a back seat to no fire force, paid or volunteer. Right now it is boasting the fact that with the acquisition of a new 65-ft. all metal aerial ladder the department has completed replacement of all old equipment within the last three years.

Since incorporation of the Pearl River Fire Department in 1907, this ladder is the 13th piece of motor-driven fire apparatus the department has had. The department has followed a policy of getting rid of all apparatus over 15 years old, both as a protection to the men, and to take advantage of the most favorable trade-in or sale allowances.

Says Dr. Edmund H. Parizot,, P.R.-F.D. Medical Officer, if we can replace equipment 15 years old, the big towns can do it also!"

George Bartels is present Pearl River Fire Chief. In addition to the 65-ft. aerial, the department has one 1000-GPM and one 750-GPM pumpers and a 250-GPM pump-equipped squad wagon.

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INTERNATIONAL BRONZE TABLET CO., INC. 150 WEST 22nd ST. NEW YORK 11, N. Y.

Fire Prevention Code

(*Continued from page* 119)

The abbreviated edition of the Fire Prevention Code deals specifically with hazards found in garages, dry cleaning and dyeing plants, motion picture houses, and in places where flammable liquids, liquefied petroleum gases, or explosives are used.

Included in the booklet is a "model ordinance" by which the Code may be adopted by title where state laws permit. The Code is offered as a public service of the capital stock fire insurance companies, and copies are available from the National Board of Fire Underwriters, 85 John Street, New York City, 222 West Adams Street, Chicago, or 1014 Merchants Exchange Building, San Francisco.

Punch Bowl Throws Fiery Punch

Near calamity came to dinner at Detroit's A. F. of L. Cook's Union party on January 17 last. Eight guests, including some of the city's most prominent citizens, were injured, four seriously, when the "cafe diablo" in the punch bowl blew up, hurling flaming liquid onto the guests at the table.

Recorder's Judge Joseph A. Gillis and Malcom W. Bingay, editorial director of the Detroit Free Press, were badly burned but are recovering. Circuit Court Judge Ira W. Jayne was burned in extinguishing a blaze in Bingay's clothing.

The lighting and serving of the "cafe diablo" was to have been the high point of the banquet's splendor—a cooks' union treat for gourmets for years. Seventy specially invited guests were on hand in a seventh-floor room of the A. F. L.'s labor temple.

The "cafe diablo"—"devil's coffee" is a burning brew of coffee and liquor. From a huge glass punch bowl between the two arms of a "U"-shaped banquet table the brew was already giving off gentle blue flames as brandy was being poured into it.

Then came the blow-off. Flame cascaded across the table, "like a flame thrower," as one guest put it. Within seconds the flame had expired, while fellow guests used their own coats, and table linens to swathe the injured. Police rushed them to hospitals.

The blast was attributed to ignition of alcohol fumes that had apparently collected over the punch bowl.

Radio Helps in Emergency

On November 1 last, radio announcers and policemen on foot warned some 250,000 Bostonians to keep home gas jets shut or risk explosion or asphyxiation.

The emergency arose when a dangerous gas system breakdown threatened householders of nine suburban Boston communities. It was imperative that occupants of houses served in the area keep all gas appliances shut off until emergency crews could check all mains and burners. It required 350 repairmen working without letup to restore the service.

Only two persons were reported affected, neither seriously, by fumes which leaked into their homes during the night. Impurities in the gas, it is reported, extinguished pilot lights in the area and permitted gas to seep into the buildings of 77,000 Malden and Melrose, Mass, gas company customers.

According to gas company officials, gas production diminished for an unexplained reason in their plant and they began mixing in reserves of propane gas. The proportion became so high the gas sent through the mains was too rich to burn properly, they said, and pilot lights and burners went out in the area. The gas was then allowed to flow through open jets in dangerous quantities.

Use of radio and police helped get notification of impending trouble over to most gas users, fire fighters, meanwhile being alerted for possible trouble.

Hospital Fire

(*Continued from page* 113)

Engine 5 rolled to the south end of the building and stretched in to operate a stream in an effort to cut off extension of the blaze but found more fire than was anticipated. The Assistant Chief entered the building where he encountered locked doors and saw fire through their glass sections. He hurried to the ground floor where he saw some fire. He thereupon ordered Engine 6 to take their line to this section. This proved to be a dropped fire which was quickly killed, the men being then ordered to carry their attack to the main floor. The Chief in his survey reached the rear of the building where he heard people pounding on a door. Unable to open the locked exit, he went around and up to the next floor where a sister gave him keys to the doors.

Meanwhile an aerial ladder was raised to a third story window on the west side of the building. The first patient, an elderly, frail woman was removed in unconscious condition. Several other women were reported taken out of this window.

Rescue efforts were intensified as fire companies rolled in, and hospital staff members came to aid from the main hospital buildings. Where patients were observed at windows, ladders were quickly raised and attempts made to remove the trapped victims. Here rescuers encountered aggravating delay in removing the bars and grilles.

Fire Chief Lester Schick, who resides near the hospital, was early on the scene and took charge. He was quickly alive to the critical situation, and under his direction the fire attack was coordinated with rescue. However, it was soon obvious there was no hope of confining the fire to any one section of the old building, which soon was fully involved, the flames lighting up the night sky. Firemen, however, were successful in preventing extension of the blaze to the other hospital units.

Of the 65 persons reported in the building at the time of the fire, 25 were rescued, one dying later from injuries. Most of the 24 survivors were rescued from windows on the west side of the building, through which firemen entered after laboriously removing or bending aside the window bars or grilles. The light wind of 7 to 10 M.P.H. from the west southwest helped drive the flames from these windows and out the east side of the building. Here, heat and fire soon made laddering and fire fighting operations impossible.

Fire department (and Iowa Inspection Bureau) reports point to the significance of the fact that six to eight patients, some unconscious, were taken out

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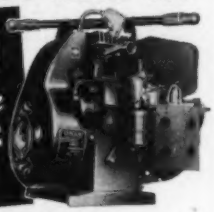

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through the one window on the second floor (previously mentioned) where the bars were so hinged that they could be removed without delay.

Firemen Driven from Interior

While some firemen raised ladders and attacked barred windows, others stretched lines from pumpers. In the early stages of the fire, fire fighters were able to advance some of these lines into the basement and some portions of the main floor. Although some progress was made in certain sections, the men were ultimately forced to retreat because of the heat and smoke on the floors and the involvement of the roof and attic spaces.

The design and construction of the structure, and the headway made by the fire before fire forces could get into action, virtually precluded effective inside operations, and eventually all fire fighting had to be undertaken from the exterior.

The fire was not brought under control until after the roof and upper floors of the rear section had collapsed. The north roof section was the first to go, after which the third floor crashed to the second story, burying the bodies of victims in the wreckage.

Miraculously enough, at 4:40 A.M., after firemen had subdued the flames so they could enter what was left of the building, they found one victim still alive in the south section of the structure. She was rushed in serious condition to the main Mercy Hospital building.

A factor which helped retard the spread of the fire to the basement was the addition of a new non-combustible surface to three-fourths of the main floor, which had been made during remodelling. The kitchen and dining room in the basement were intact after the fire was controlled.

At the height of the fire, ten pumper streams were in use. One of the eight hydrants on the hospital grounds was out of service due to a broken stem but other hydrants were available in nearby streets and there was at no time any shortage of water. Hydrants on the grounds were connected to 6-inch mains, in turn supplied by 8-inch on Marquette and West Lombard streets.

Identification Difficult

As in other similar disasters, the condition of the burned victims was such as to make identification difficult, if not impossible. The task of locating victims also was complicated by the almost total destruction of the building interior. It was not until power earth removing and wrecking equipment was brought to the scene that the walls could be brought down, the debris removed and final bodies were recovered.

During the fire, available ambulances were put into service but there was little need of transporting the injured, most of whom were cared for in the other Mercy Hospital units.

Fire Chief Lester Schick estimated the property loss at $200,000.

Conclusions

Although all the evidence concerning this tragedy is incomplete at this writing, there are sufficient factual data to warrant the following conclusions concerning the heavy loss of life.

1) There was inexcusable delay in

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(F. E. Boren, Chief, Fire Dept., Silver City, N. M.)

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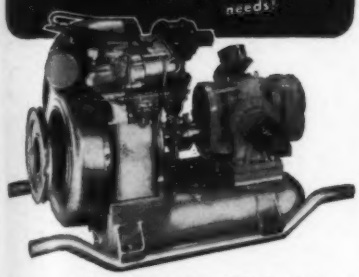

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discovering the fire. The alarm box on the grounds near St. Elizabeth's was not operated at any time. Evidence is conclusive that the fire had great headway before the department could get into action.

2) The method of communicating alarms of fire to the department from the individual hospital units is slow and unreliable.

3) The building was of a type which should not have housed the mentally sick. The structure was "built to burn."

4) It is recognized that some form of window bars and/or grilles may be required on such institutions to prevent escape of patients. However, such "protection" can and should be made readily removable from the outside. The same applies to locked doors. It is possible instantly and easily to release all electrically controlled locked doors in an institution from a central location.

5) Aside from the fire resistant floor, the alterations through the years failed to lessen the fire hazard; rather, they increased them. The presence of unusually large amounts of combustible interior finish, absence of fire-stopping in the furring behind lath on exterior walls, the existence of old, open vent flues with openings on each story, and inadequate enclosure of floor openings, stairs and dumb waiter shaft with fire resistive materials, together with the long, unbroken passageways and absence of fire doors or other cut-offs, all contributed to a hot fast spreading fire.

6) There was lack of any well prepared and organized plan or program for the handling and evacuation of patients under emergency conditions. Further, there was inadequate staff to direct and conduct such evacuation. Dependence was placed upon one individual, to handle an emergency, at the time of day when additional help is least available, yet when it may be most vitally needed. The practice of maintaining the staff (particularly the night shift) at individual detached units of large institutions and of depending upon getting help from the main building in an emergency is all too prevalent.

7) Too often, records of patients and visitors are loosely kept and so located that any serious fire may destroy them, thus increasing difficulty of identification.

8) Finally: there was, and apparently is, confusion over existing state and local laws and ordinances to compel inspections of such occupancies and to prosecute violations.

As in the case of St. Anthony's Hospital in Effingham, the cost to install building fire safeguards and of adequate fire detection alarm notification and extinguishing systems may be only a fraction of the amount of money that may be involved in lawsuits and litigation.

Respiratory Equipment

(*Continued from page* 122)

and escape; local fire fighting facilities; locating and removing victims and casualties. It means extinguishing more fire with less effort and extinguishing agents, therefore at less cost and at greater saving in lives and property.

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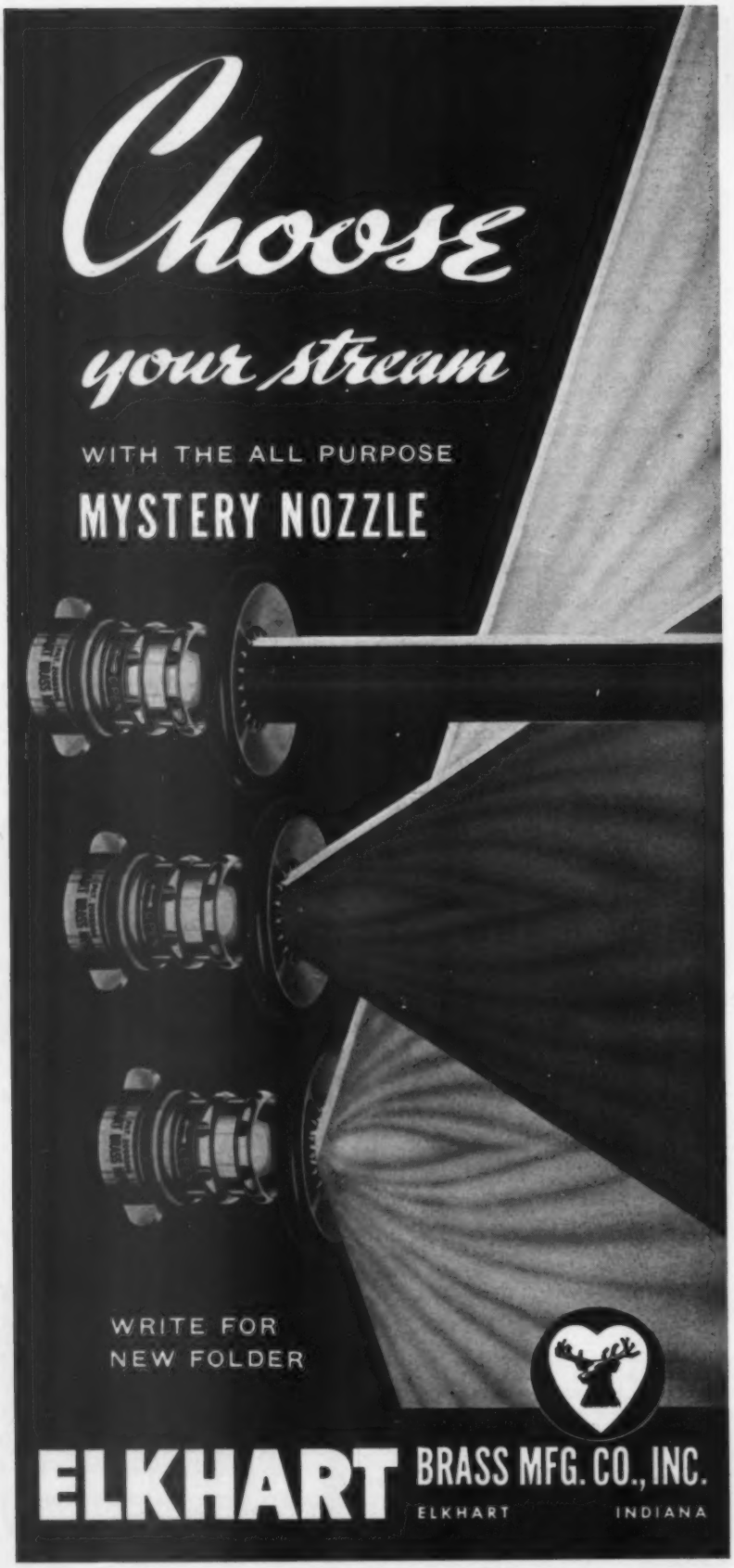

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